SONY

DECODER BOARD

BKPF-131P

OPERATION AND MAINTENANCE MANUAL
1st Edition
Serial No. 10001 and Higher

For the customers in the USA

Warning–This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC rules.

For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Pour les utilisateurs au Canada

Cet appareil est conforme aux normes Classe A pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

Bescheinigung des Herstellers

Hiermit wird bescheinigt, daß die Decoderkarte BKPF-131P in Übereinstimmung mit den Bestimmungen der BMPT-Amtsblatt Vfg 243/1991 und Vfg 46/1992 funkentstört ist. Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung. Dem Bundesamt für Zulassungen in der Telekommunikation wurde das inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Sony Corporation
Hugo Eckener Str 20
50829 Köln

Hinweis

Gemäß dem Amtsblätter des BMPT Nm. 61/1991 und 6/1992 wird der Betreiber darauf aufmerksam gemacht, daß die von ihm mit diesem Gerät zusammengestellte Anlage auch den technischen Bestimmungen dieser Amtsblätter genügen muß.

TABLE OF CONTENTS
INHALTSVERZEICHNIS

1. OPERATION

1-1. Overview ..... 1-1 (E)
1-2. Location and Function of Parts ..... 1-2 (E)
1-2-1. Board and Connector Panel ..... 1-2 (E)
1-2-2. Parts Mount Side ..... 1-4 (E)
1-3. Specifications ..... 1-5 (E)

1. BETRIEB

1-1. Überblick ..... 1-1 (G)
1-2. Lage und Funktion der Bedienungselemente ..... 1-2 (G)
1-2-1. Leiterplatte und Anschlußfeld ..... 1-2 (G)
1-2-2. Bestückungsseite ..... 1-4 (G)
1-3. Technische Daten ..... 1-5 (G)

2. SERVICE INFORMATION

2-1. Unpacking and Repacking 2-1
2-2. Installation and Removal of the Board 2-2
2-3. Switch Setting and Explanation 2-5
2-4. Connectors 2-5
2-5. Precautions on Maintenance 2-6
2-6. Replacement Procedure for Chip Parts 2-6

3. ELECTRICAL ALIGNMENTS

3-1. A/D REF Voltage Adjustment 3-2
3-2. SERIAL OUT Freerun Adjustment 3-2
3-3. REF CLOCK DUTY Adjustment 3-2
3-4. VIDEO LEVEL Adjustment 3-2
3-5. LINEARITY Adjustment 3-3
3-6. SYNC AGC Adjustment 3-3
3-7. SCH Adjustment 3-4
3-8. R–Y/B–Y (Vector Mode) Level Check 3-4
3-9. GAIN MANUAL Mode Operation Check 3-5
3-10. BLACK LEVEL Mode Check 3-6
3-11. FREEZE Mode Check 3-6
3-12. AUTO FREEZE Mode Check 3-6
3-13. SYSTEM DELAY Check (1) 3-7
3-14. SYSTEM DELAY Check (2) 3-8

4. BLOCK DIAGRAM

Overall 4-1

5. SEMICONDUCTOR PIN ASSIGNMENTS

6. BOARD LAYOUTS AND SCHEMATIC DIAGRAMS

DEC-76 6-2
CN-476 6-10

7. SPARE PARTS

7-1. Parts Information 7-1
7-2. Exploded View 7-2
7-3. Electrical Parts List 7-3

Section 1 Operation

1-1 Overview

The BKPF-131P decoder board converts analog composite video signals into 4:2:2 component serial digital video signals. When this decoder board is installed in a PFV-D50, PFV-D100, or PFV-D200 digital video interface unit, the composite analog video signals are converted into component digital video signals, distributed into four output signals, and finally output.

Note

This board does not accept black-and-white signals, signals with jitter, and signals with unstable SCH.

Refer to the operation and maintenance manual supplied with the digital video interface unit for details on how to install the decoder board.

Use within a system

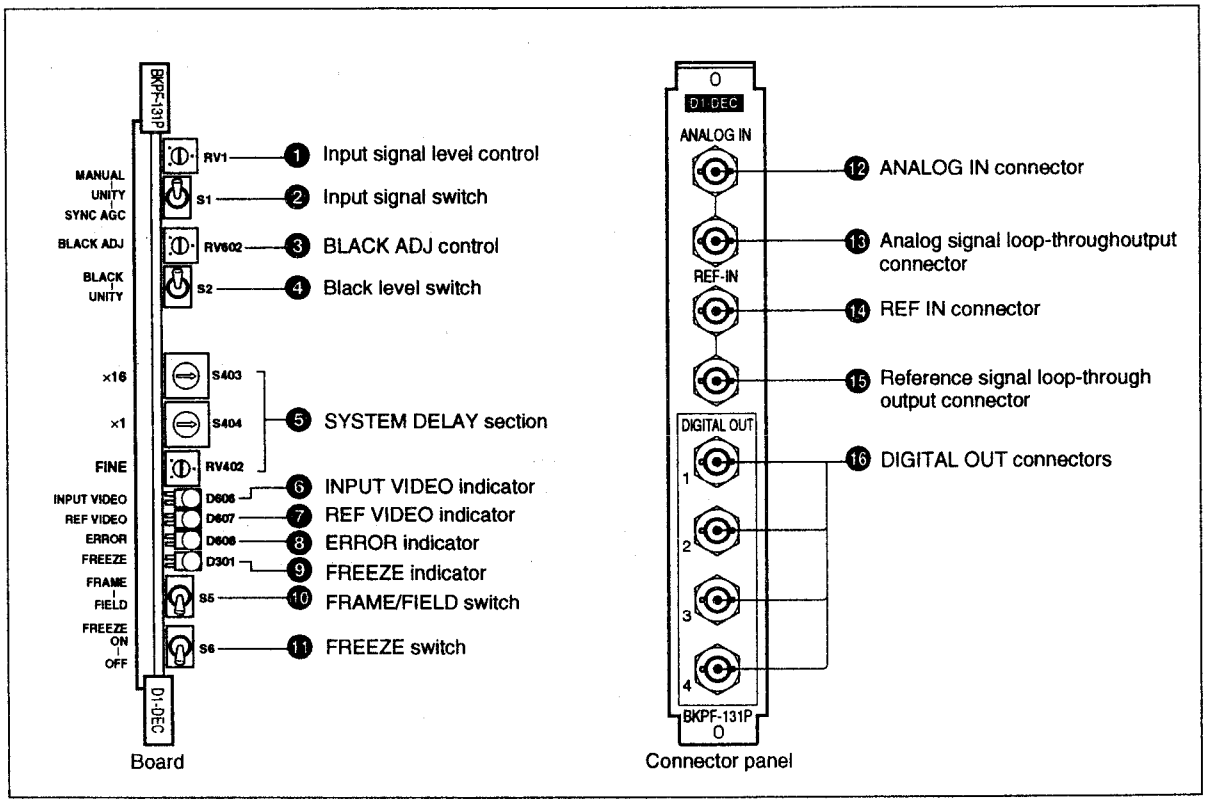
The construction and power voltage of the BKPF-131P comply with the other boards designed for the PFV-D50, PFV-D100, and PFV-D200 digital interface video units. These boards can be mounted in these interface units in any combination.

Parts list

Board (1)
Connector panel (1)
Operation and maintenance manual (1)
Slot number labels (1 set)

1-2 Location and Function of Parts

1-2-1 Board and Connector Panel



BKPF-131P

❶ Input signal level control (RV1)
Used to adjust the level of the video signals input to the ANALOG IN connector in a range of ±3 dB. Set the input signal switch to the MANUAL position to enable adjustments using this control.

❷ Input signal switch (S1)
Used to select one of the following adjustment modes for the video signals input to the ANALOG IN connector.

MANUAL: Allows you to adjust the input signal level using the input signal level control (RV1).

UNITY: Outputs the input signals without performing adjustments.

SYNC AGC: Adjusts the input signal level automatically in reference to the synchronizing signal.

❸ BLACK ADJ (black level) control (RV602)
Used to adjust the black level of the signals input to the ANALOG IN connector in a range of ±10%. Set the black level switch to the BLACK position to enable this control.

❹ Black level switch (S2)
Used to select one of the following adjustment modes for the black level of the signals input to the ANALOG IN connector.

BLACK: Allows you to adjust the black level of the input signals using the BLACK ADJ control (RV602).

UNITY: Outputs the input signals in their original black level.

❺ SYSTEM DELAY section (S403, S404, RV402)
Used to set the delay of the digital video signals which have been synchronized with the reference signal.
COARSE×16 (S403): Set the delay by 592 nsec steps. The factory setting is the "8" position.
×1 (S404): Set the delay by 37 nsec steps. The factory setting is the "0" position.
FINE (RV402): Continuously adjusts the delay in a range from 0 to 37 nsecs.

❻ INPUT VIDEO (input video signal) indicator (D606)
Lights green when analog video signals are input to the ANALOG IN connector. It lights red when there is no signal input.

❼ REF VIDEO (reference video signal) indicator (D607)
Lights green when reference video signals are input to the REF IN connector. It lights red when there is no signal input.

❽ ERROR indicator (D608)
Lights red in the following cases.
- No signal input to the ANALOG IN connector.
- No signal input to the REF IN connector.
- No signal output from the DIGITAL OUT connector.
- Communication error with the CPU.

❾ FREEZE indicator (D301)
Lights green when the FREEZE switch is set to the ON position and the input signals are frozen.

❿ FRAME/FIELD switch (S5)
Used to set the freeze mode to frame or field.
FRAME: Freezes the input signals in frame mode.
FIELD: Freezes the input signals in field mode.

⓫ FREEZE switch (S6)
Used to set whether or not to freeze the input signals.
ON: Freezes the input signals. Set the freeze mode using the FRAME/FIELD switch. If you set the FREEZE switch to this position, the FREEZE indicator lights green.
OFF: Does not freeze the input signals.

⓬ ANALOG IN (analog signal input) connector (BNC type)
Accepts analog composite video signals.

Note

This connector does not accept black-and-white signals, signals with jitter, and signals with unstable SCH.

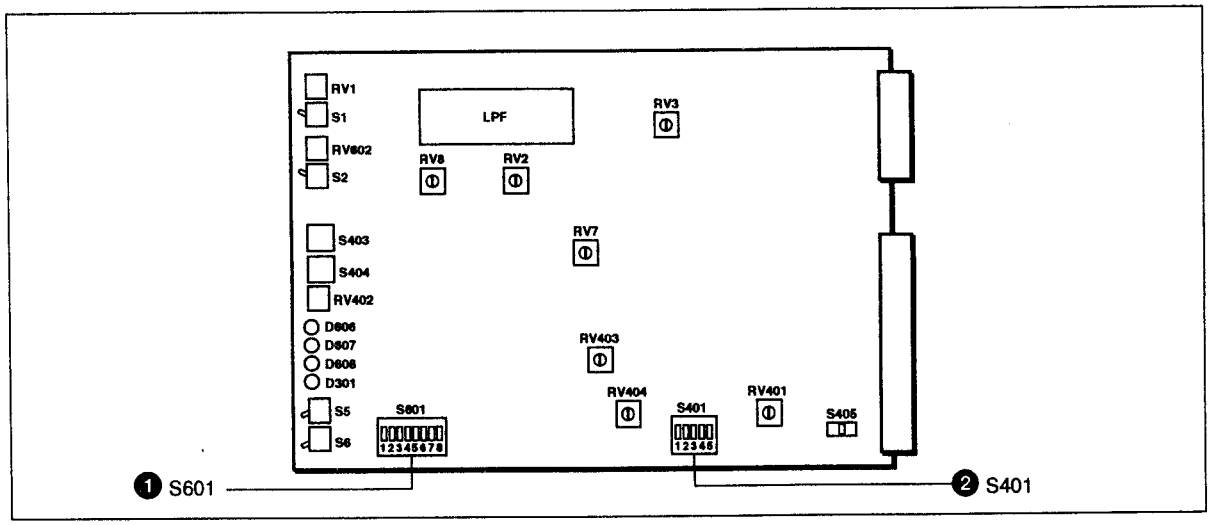
⓭ Analog signal loop-through output connector (BNC type)
Outputs the signals input to the ANALOG IN connector in their original form (loop-through output).
Attach a 75-ohm terminator when this connector is not used.

⓮ REF IN (reference input) connector (BNC type)
Accepts the analog black burst signal to be used as the reference signal.

⓯ Reference signal loop-through output connector (BNC type)
Outputs the signals input to the REF IN connector in their original form (loop-through output).
Attach a 75-ohm terminator when this connector is not used.

⓰ DIGITAL OUT (digital signal output) connector (BNC type)
Outputs the signals input to the ANALOG IN connector that have been converted to 4:2:2 component serial digital signals and synchronized with the reference signal input to the REF IN connector. Connectors 1 through 4 output the same signals.

1-2-2 Parts Mount Side



Parts mount side

❶ S601
Switches 1 through 8 work as follows.

S601-1
Used to enable or disable (ON/OFF) the auto freeze function which automatically goes to freeze mode if an input signal is absent.

S601-2, S601-4, S601-5, S601-6, and S601-8
Fix to OFF.

S601-3
Used to set the optional setting of the vertical blanking section to Y/C separation or B&W mode.
ON: Goes to Y/C separation mode
OFF: Goes to B&W mode.

S601-7
Used to select the line to control the black level of the vertical blanking period.
ON: Controls the lines from line 6 and after for odd fields, and from line 319 and after for even fields.
OFF: Controls the lines from the later half of line 23 and after for odd fields, and from line 336 and after for even fields.

❷ S401
Switches 1 through 5 work as follows.

S401-1 and S401-2
Used to set the output phase deviation with the reference video signal.

S401-1	S401-2	Output phase
ON	ON	2H advanced
ON	OFF	1H advanced
OFF	ON	in-phase
OFF	OFF	1H delayed

S401-3
Used to enable or disable (ON/OFF) blanking. This switch is set to ON at the factory.
ON: Enables blanking of lines 6 through the first half of line 23 for odd fields, and lines 319 through 335 for even fields.
OFF: Disables blanking operation.

S401-4 and S401-5
Fix to OFF.

1-3 Specifications

General	
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Operating humidity	10% to 90% (no condensation)
Dimensions	Board: 195 × 310 mm (h/w) (7 3/4 × 12 1/4 inches) Connector panel: 195 × 25 mm (h/w) (7 3/4 × 1 inches)
Mass	Board: 650 g (1 lb 8 oz) Connector panel: 200 g (7 oz)
Power requirements	+5V DC: 1700 mA –5V DC: 600 mA (supplied from the PFV-D50/D100/D200)
Power consumption	11.5 W
Input/output	
Analog input	ANALOG IN connector (BNC type) (1) 1.0 Vp-p, 75 ohms, PAL analog composite video signal, with loop-through output REF IN connector (BNC type) (1) 0.3 Vp-p, 75 ohms, black burst signal, with loop-through output
Digital output	DIGITAL OUT connectors (BNC type) (4) 0.8 Vp-p±10%, 75 ohms 4:2:2 component serial digital video signal
Video characteristics	
Sampling frequency	
Input	17.734 MHz
Output	Y signal: 13.5 MHz R-Y, B-Y signals: 6.75 MHz
Digitization bits	10 bits
Band width	Y signal: 5.75 MHz
K factor (2T pulse)	1% or less
Signal-to-noise ratio	58 dB or more
Y/C delay	±10 nsec or less

Design and specifications are subject to change without notice.

Teil 1 Betrieb

1-1 Überblick

Die Decoderkarte BKPF-131P wandelt ein analoges FBAS-Videosignal in ein serielles 4:2:2-Komponenten-Digitalsignal um. Wird die Decoderkarte in das Digital-Interface PFV-D50, PFV-D100 oder PFV-D200 eingesetzt, wird das eingespeiste analoge FBAS-Videosignal nach der Umwandlung in ein digitales Komponentensignal über vier Ausgangsbuchsen ausgegeben.

Hinweis

Schwarzweißsignale, mit Jitter behaftete Signale und Signale mit unstabiler SCH-Phase können nicht von dieser Karte verarbeitet werden.

Genaueres zur Installation der Decoderkarte entnehmen Sie bitte der Bedienungs- und Wartungsanleitung des Digital-Interfaces.

Zur Systemkonfiguration

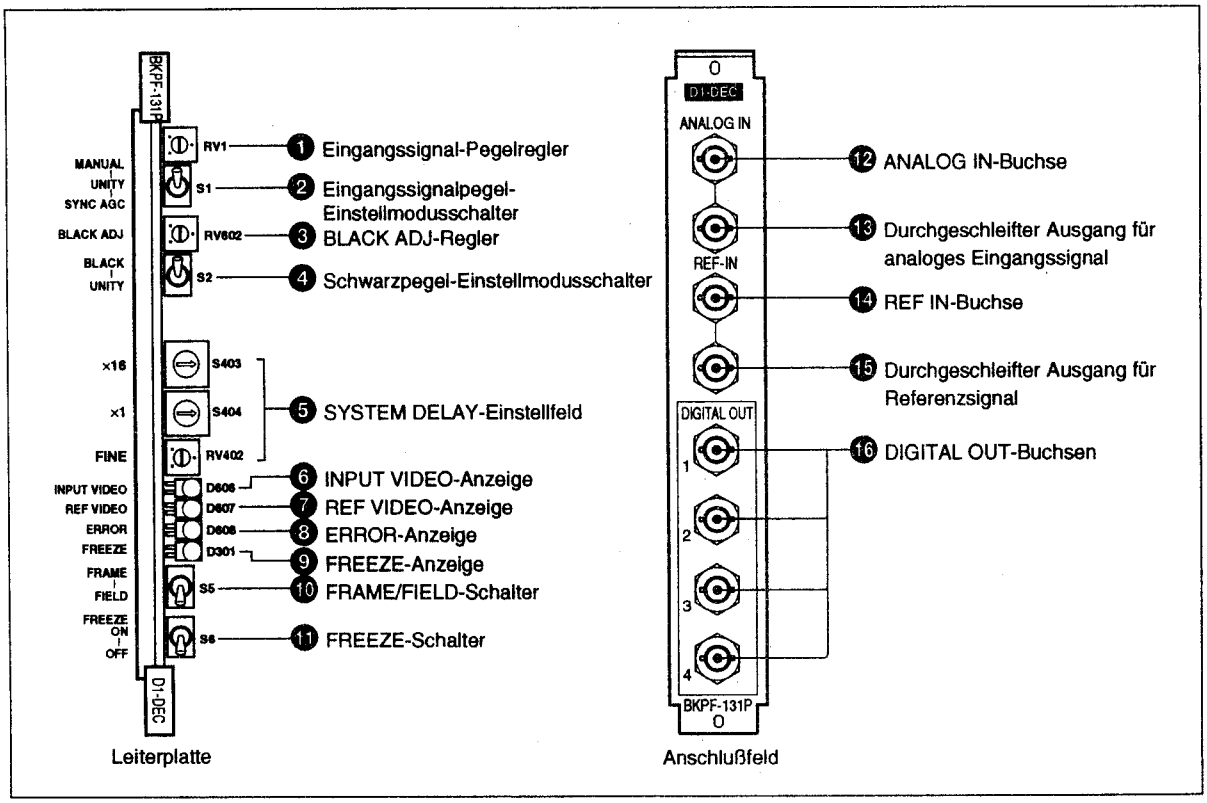
Aufbau und Versorgungsspannung der BKPF-131P stimmen mit den anderen für das Digital-Interface PFV-D50, PFV-D100 bzw. PFV-D200 bestimmten Karten überein. Die Karten können in beliebiger Kombination in das Interface eingesetzt werden.

Teileliste

Leiterplatte (1)
Anschlußfeld (1)
Bedienungs- und Wartungs-Anleitung (1)
Schachtnummern-Aufkleber (1 Satz)

1-2 Lage und Funktion der Bedienungselemente

1-2-1 Leiterplatte und Anschlußfeld



BKPF-131P

❶ Eingangssignal-Pegelregler (RV1)
Mit diesem Regler kann der Pegel des über die ANALOG IN-Buchse zugeleiteten Videosignals in einem Bereich von ±3 dB variiert werden, wenn der Eingangssignalpegel-Einstellmodusschalter (S1) auf MANUAL steht.

❷ Eingangssignalpegel-Einstellmodusschalter (S1)
Für die Pegeleinstellung des über die ANALOG IN-Buchse zugeleiteten Videosignals können folgende Modi gewählt werden.
MANUAL: Der Eingangssignalpegel kann am Eingangssignal-Pegelregler (RV1) eingestellt werden.
UNITY: Der Pegel des Eingangssignals wird nicht geändert.
SYNC AGC: Der Eingangssignalpegel wird automatisch entsprechend des Synchronsignals eingestellt.

❸ BLACK ADJ-Regler (RV602)
Mit diesem Regler kann der Schwarzpegel des über die ANALOG IN-Buchse zugeleiteten Signals in einem Bereich von ±10% variiert werden, wenn der Schwarzpegel-Einstellmodusschalter (S2) auf BLACK steht.

❹ Schwarzpegel-Einstellmodusschalter (S2)
Für die Schwarzpegel-Einstellung des über die ANALOG IN-Buchse zugeleiteten Signals können folgende Modi gewählt werden.
BLACK: Der Schwarzpegel des Eingangssignals kann am BLACK ADJ-Regler (RV602) eingestellt werden.
UNITY: Der Schwarzpegel des Eingangssignals wird nicht geändert.

❺ SYSTEM DELAY-Einstellfeld (S403, S404, RV402)
Mit den folgenden Schaltern und Reglern kann die Verzögerung des mit dem Referenzsignal synchronisierten digitalen Videosignals eingestellt werden.
COARSE×16 (S403): Zur Einstellung der Verzögerung in 592 ns-Schritten. Werksseitig steht der Schalter auf 8.
×1 (S404): Zur Einstellung der Verzögerung in 37 ns-Schritten. Werksseitig steht der Schalter auf 0.
FINE (RV402): Zur kontinuierlichen Verzögerungseinstellung in einem Bereich von 0 bis 37 ns.

❻ INPUT VIDEO-Anzeige (D606)
Wenn an der ANALOG IN-Buchse ein analoges Videosignal anliegt, leuchtet die Anzeige grün auf. Liegt kein Signal an, leuchtet die Anzeige rot.

❼ REF VIDEO-Anzeige (D607)
Wenn an der REF IN-Buchse ein Referenz-Videosignal anliegt, leuchtet diese Anzeige grün auf. Liegt kein Signal an, leuchtet die Anzeige rot.

❽ ERROR-Anzeige (D608)
Leuchtet in folgenden Fällen rot auf:
- Kein Eingangssignal an der ANALOG IN-Buchse.
- Kein Eingangssignal an der REF IN-Buchse.
- Kein Ausgangssignal an der DIGITAL OUT-Buchse.
- Kommunikationsfehler mit der CPU.

❾ FREEZE-Anzeige (D301)
Leuchtet grün auf, wenn der FREEZE-Schalter auf ON steht (Eingangssignal wird eingefroren).

❿ FRAME/FIELD-Schalter (S5)
Zur Festlegung, ob Voll- oder Halbbilder eingefrorenen werden.
FRAME: Einfrierung von Vollbildern.
FIELD: Einfrierung von Halbbildern.

⓫ FREEZE-Schalter (S6)
Zur Festlegung, ob das Eingangssignal eingefroren wird oder nicht.
ON: Das Eingangssignal wird eingefroren, und die FREEZE-Anzeige leuchtet grün auf. Mit dem FRAME/FIELD-Schalter kann zwischen Voll- und Halbbild gewählt werden.
OFF: Das Eingangssignal wird nicht eingefroren.

⓬ ANALOG IN-Buchse (BNC)
Zur Zuleitung eines analogen FBAS-Videosignals.

Hinweis
Schwarzweißsignale, mit Jitter behaftete Signale und Signale mit unstabiler SCH-Phase können nicht von dieser Karte verarbeitet werden.

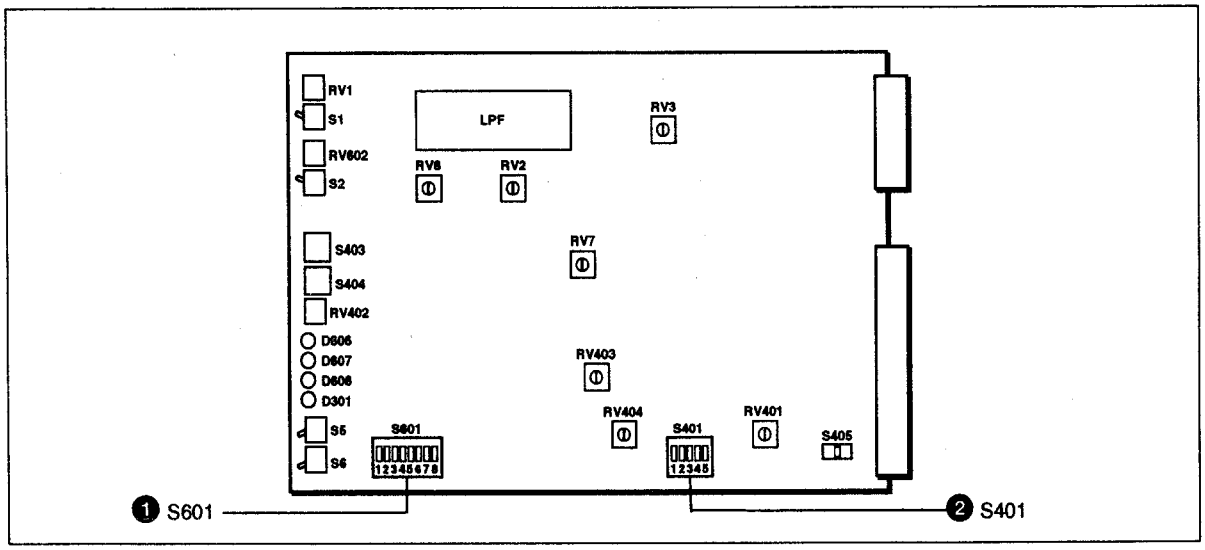
⓭ Durchgeschleifter Ausgang für analoges Eingangssignal (BNC)
Diese Buchse gibt das der ANALOG IN-Buchse zugeleitete Signal unverändert aus.
Wenn an dieser Buchse kein Signal abgegriffen wird, bringen Sie den 75-Ohm-Abschluß an.

⓮ REF IN-Buchse (BNC)
Zur Zuleitung eines analogen Schwarzburstes, der als Referenz verwendet wird.

⓯ Durchgeschleifter Ausgang für Referenzsignal (BNC)
Diese Buchse gibt das der REF IN-Buchse zugeleitete Signal unverändert aus.
Wenn an dieser Buchse kein Signal abgegriffen wird, bringen Sie den 75-Ohm-Abschluß an.

⓰ DIGITAL OUT-Buchsen (BNC)
Über diese Buchsen wird das Signal der ANALOG IN-Buchse ausgegeben, nachdem es zuvor in ein serielles 4:2:2-Komponenten-Digitalsignal umgewandelt und mit dem Referenzsignal der REF IN-Buchse synchronisiert wurde. Alle Buchsen (1 bis 4) geben das gleiche Signal aus.

1-2-2 Bestückungsseite



Bestückungsseite

1 S601
Die Segmente 1 bis 8 dieses DIP-Schalters haben folgende Funktionen:

S601-1
Zum Ein- und Ausschalten der Einfrierautomatik. Die Einfrierautomatik friert das Bild automatisch ein, wenn das Eingangssignal unterbrochen wird.

S601-2, S601-4, S601-5, S601-6 und S601-8
Diese Segmente sind fest auf OFF geschaltet.

S601-3
Zur Einstellung des Vertikalaustastmodus (Y/C-Trennung oder Schwarzweiß).
ON: Y/C-Trennung
OFF: Schwarzweiß

S601-7
Zur Festlegung der Zeile für die Schwarzpegelfestlegung der Vertikalaustastlücke.
ON: Zeilen ab Zeile 6 für ungerade Halbbilder bzw. ab Zeile 319 für gerade Halbbilder.
OFF: Zeilen ab der hinteren Hälfte von Zeile 23 für ungerade Halbbilder bzw. ab Zeile 336 für gerade Halbbilder.

2 S401
Die Segmente 1 bis 5 dieses DIP-Schalters haben folgende Funktionen:

S401-1 und S401-2
Zur Verschiebung der Ausgangssignalphase in Bezug auf das Referenzsignal.

S401-1	S401-2	Ausgangssignalphase
ON	ON	2H voreilend
ON	OFF	1H voreilend
OFF	ON	in Phase
OFF	OFF	1H verzögert

S401-3
Zum Aktivieren bzw. Desaktivieren der Austastung. Werksseitig ist der Schalter auf ON geschaltet.
ON: Austastung zwischen der Zeilen 6 und der ersten Hälfte von Zeile 23 bei ungeraden Halbbildern und zwischen 319 und 335 bei geraden Halbbildern aktiviert.
OFF: Austastung desaktiviert.

S401-4 und S401-5
Diese Segmente sind fest auf OFF geschaltet.

1-3 Technische Daten

Allgemeines

Betriebstemperaturbereich	5 °C bis 40 °C
Lagertemperaturbereich	–20 °C bis +60 °C
Betriebsfeuchtigkeit	10% bis 90% (nicht kondensiert)
Abmessungen	Leiterplatte: 195 × 310 mm (H/B) Anschlußfeld: 195 × 25 mm (H/B)
Gewicht	Leiterplatte: 650 g Anschlußfeld: 200 g
Betriebsspannung und Stromaufnahme	+5 V Gleichspannung, 1700 mA –5 V Gleichspannung, 600 mA (von PFV-D50/D100/D200 geliefert)
Leistungsaufnahme	11,5 W

Eingang/Ausgang

Analogeingang	ANALOG IN-Buchse (BNC) (1) 1,0 Vss, 75 Ohm, analoges PAL FBAS-Signal, mit durchgeschleiftem Ausgang REF IN-Buchse (BNC) (1) 0,3 Vss, 75 Ohm, Schwarzburstsignal, mit durchgeschleiftem Ausgang
Digitalausgang	DIGITAL OUT-Buchsen (BNC) (4) 0,8 Vss ±10%, 75 Ohm, serielles 4:2:2-Komponenten-Digitalsignal

Daten des Videosignals

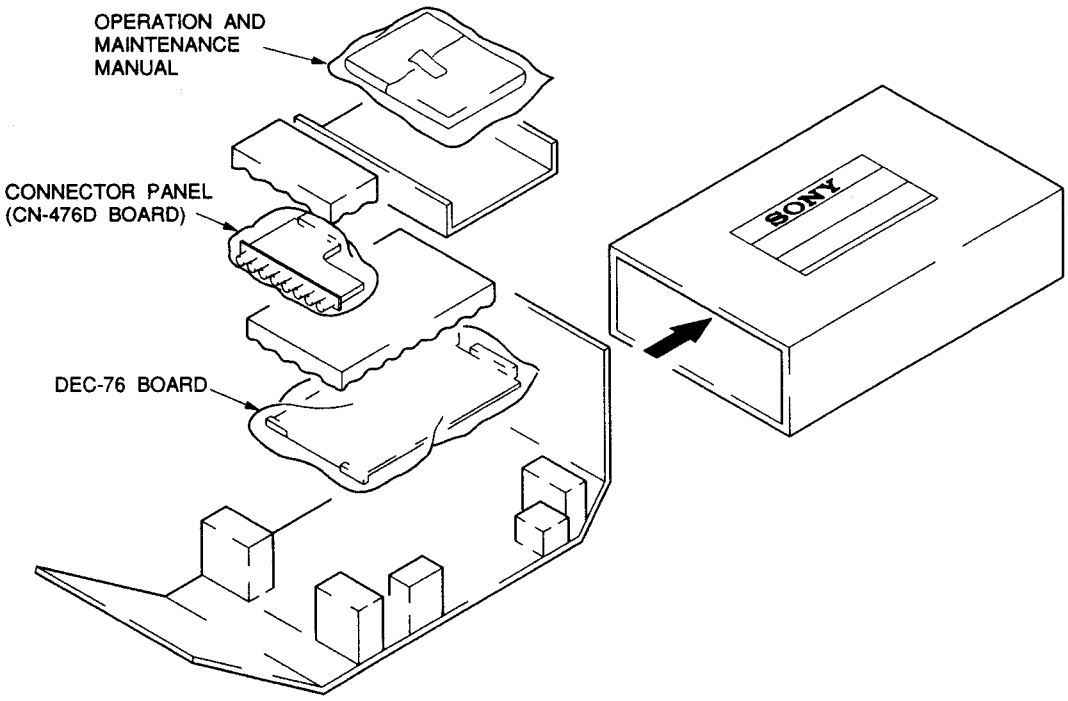
Abtastfrequenz	
Eingang	17,734 MHz
Ausgang	Y-Signal: 13,5 MHz R-Y/B-Y-Signale: 6,75 MHz
Digitalisierung	10 Bit
Bandbreite	Y-Signal: 5,75 MHz
K-Faktor (2T-Impuls)	1% oder weniger
Signal-Rauschabstand	58 dB oder mehr
Y/C-Verzögerung	±10 ns oder weniger

Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

(1)

SECTION 2
SERVICE INFORMATION

2-1. UNPACKING AND REPACKING

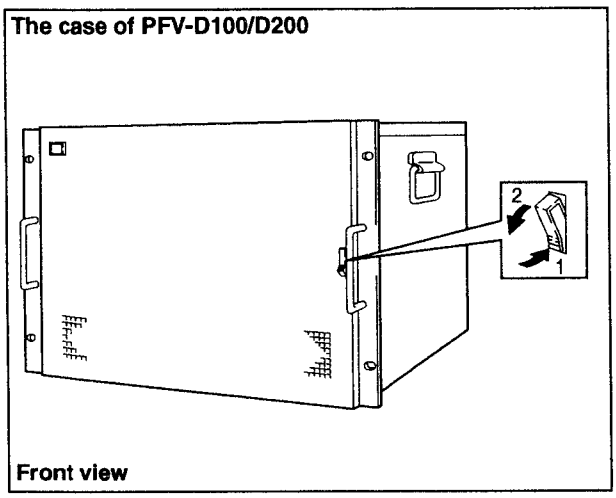


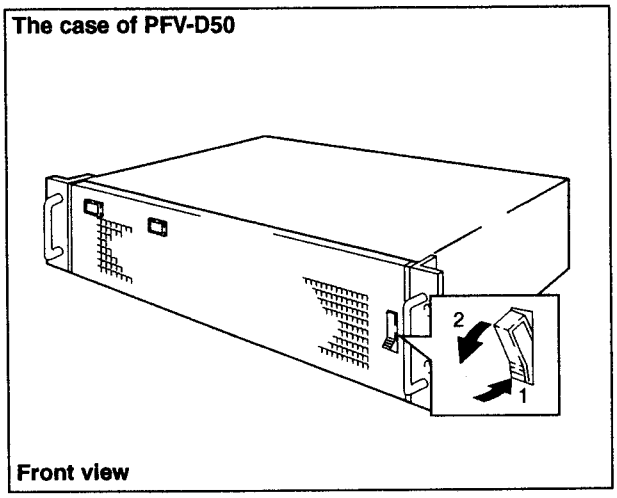
2-2. INSTALLATION AND REMOVAL OF THE BOARD

• The board in a slot of the PFV-D50/D100/D200 as shown below.
The board can be inserted into any empty slot.

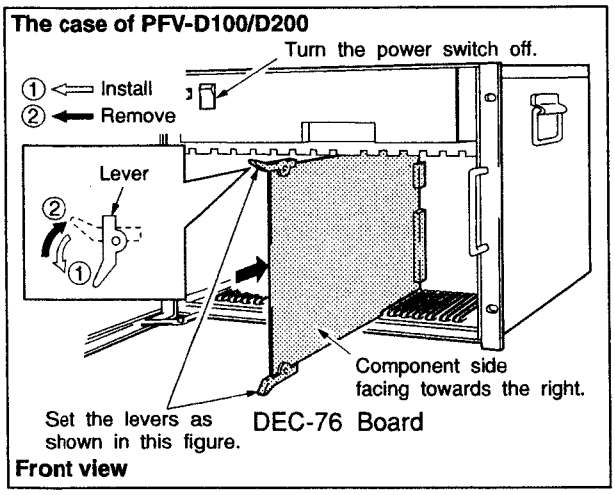
[How to install the board]

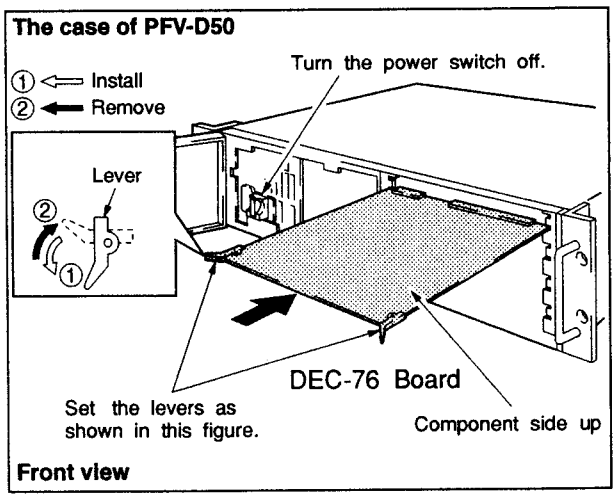
1. Open the front door.



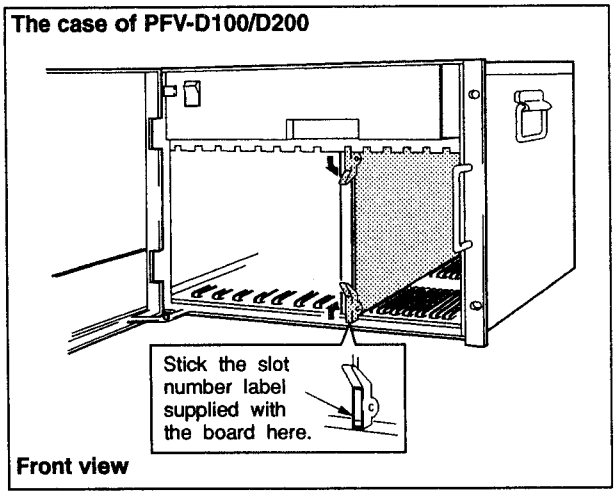


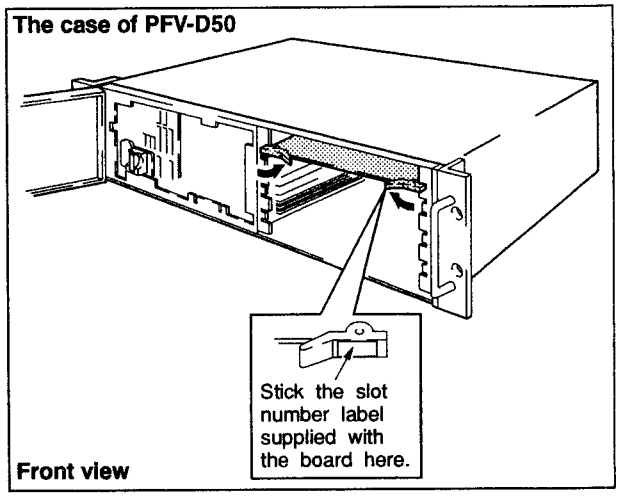
2. Turn the power of the PFV-D50/D100/D200 off.
3. Intert the board into the slot.



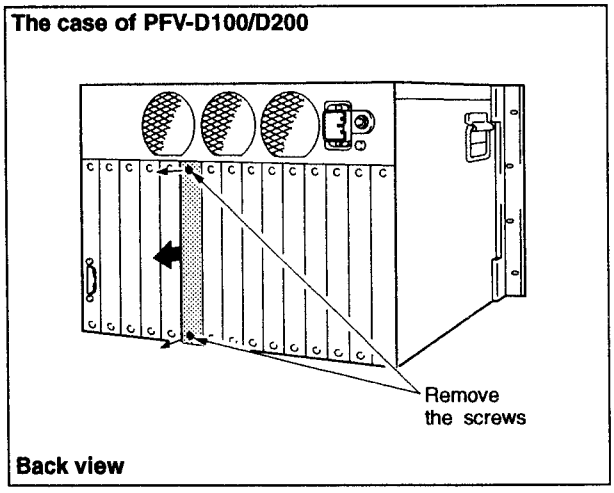


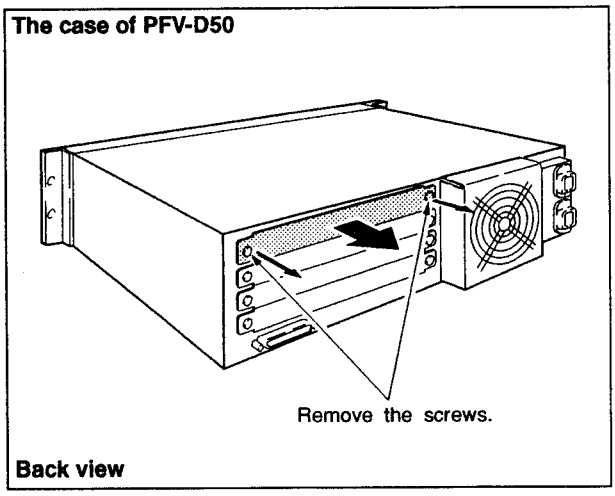
4. Move the levers to the inside and push the board in until it is inserted in the connector section of the mother board.





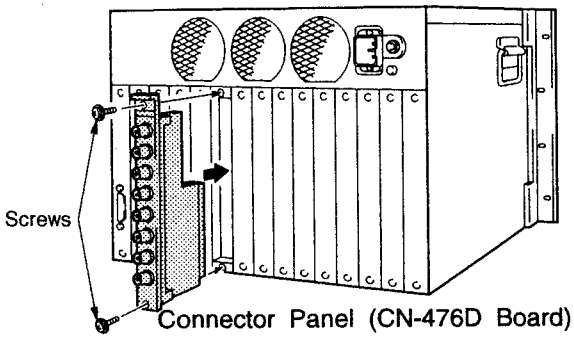
5. Close the front door.
6. Remove a blank panel corresponding to the slot where the board is to be inserted from the rear panel of the PFV-D200/D100/D50.





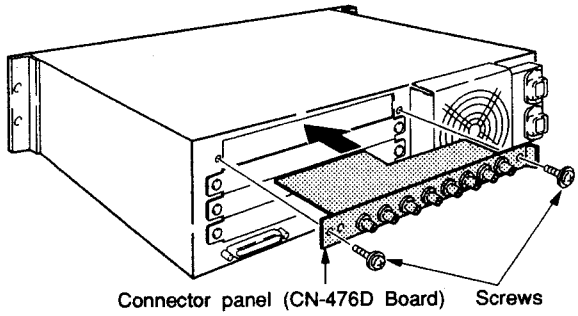
7. Attach the connector panel to the rear panel of the PFV-D50/D100/D200, and secure it with the screws with witch the blank panel has been secured.

The case of PFV-D100/D200



Back view

The case of PFV-D50



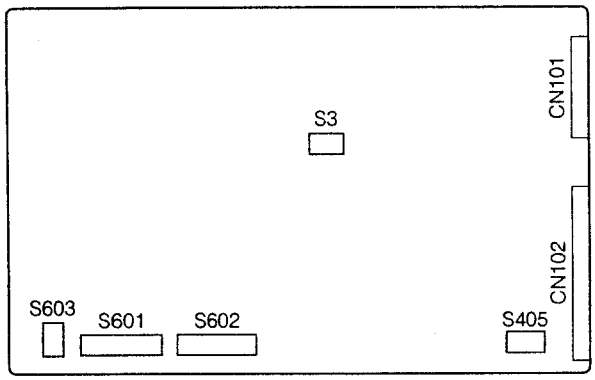
Back view

[How to remove the board] (DEC-76 Board)

1. Open the front door.
2. Turn the power off.
3. Open the levers to the outside, and pull the board out.

2-3. SWITCH SETTING AND EXPLANATION

Setting of select switch of BKPF-131P are as shown below.



DEC-76 BOARD (A SIDE)

DEC-76 BOARD

S3-1/2 (E3) : Factory Use
Fixed to ON.

S405 (G6) : Free Run Adjstment Switch of Parallel Serial Converter.
Fixed to OFF.

S601 (B6) : 8P Dip Switch
Bit2 : Factory Use
Fixed to OFF.
Bit4 : RS-232C ON/OFF Switch
Used for check CPU.
Fixed to OFF.
Bit5, 6 : Factory Use
Fixed to OFF.
Bit8 : Factory Use
Fixed to OFF.
FACTORY SETTING Bit1~Bit8: OFF

S602 (C6) : Factory Use
Fixed to OFF.

S603 (A6) : Microcomputer Reset Switch
NOTE: Do not press this switch on normal operation.

NOTE: Unless the switches specified above, refer to "Section 1-2-2. Parts Mount Side".

2-4. CONNECTORS

Connector of BKPF-131P side	Connector of conformity	
Type	Type	Sony Part No.
BNC	BNC	1-560-069-11

2-5. PRECAUTIONS ON MAINTENANCE

(1) Safety Related on Components Warning
Components identified by ⚠ marked on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony Parts whose part numbers appear as shown in this manual supplement published by Sony.

(2) Standardization of Parts
Repair parts supplied from Sony Parts Center may not be always identical with the part which actually in use due to "accommodating the improved parts and/or enginneering changes" or "standardization of genuine parts". This manual's exploded views and electrical spare parts list are indicating the parts number of "the standization genuine parts at present".

(3) Stoked of Parts
The parts marked with "S" in the SP column of the exploeded views and electrical spare parts list are normally required for routine service work. Order for parts marked with "O" will be processed, but allow for additional delivery time.

(4) All resistors are in ohms.

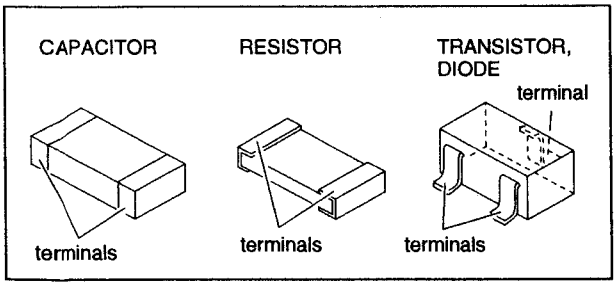
2-6. REPLACEMENT PROCEDURE FOR CHIP PARTS

Required Tools

Soldering iron 20W: If possible, use a soldering iron tip heat controller at 270±10 °C
Braided wire: SOLDER TAUL or equivalent Sony part No. 7-641-300-81
Solder: 0.6 mm dia. is recommended.
Tweezers

Soldering conditions

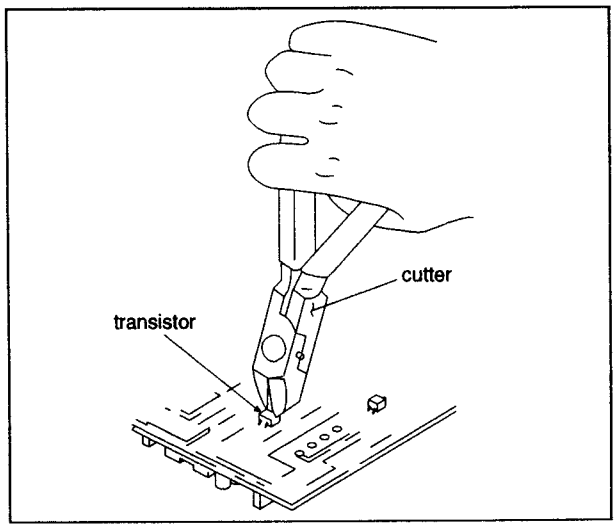
Soldering iron temperature; 270±10 °C
Soldering time; Less than two seconds per a pin



Resistor and Capacitor Replacement

1. Place the soldering iron tip onto the chip part and heat it up until the solder is melted. When the solder is melted, slide the chip part aside.
2. Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
3. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
4. Place new chip part in the desired position and solder both ends.

Note: Once a chip part has been removed, never use it again.



Transistor and Diode Replacement

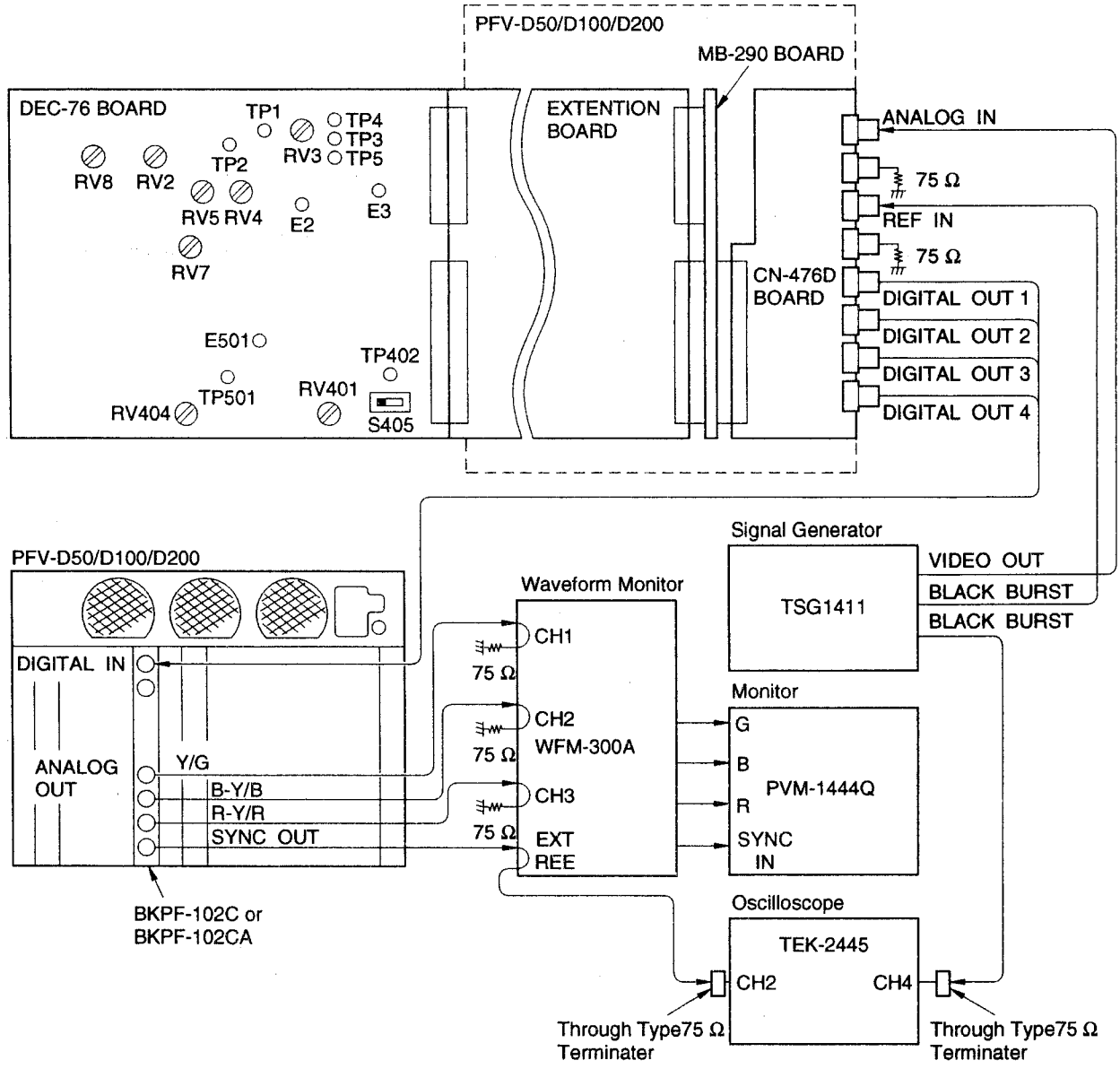
1. Cut the terminals of the chip part with cutters.
2. Remove the cut leads with soldering iron.
3. Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
4. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
5. Place new chip part in the desired position and solder the terminals.

IC Replacement

1. Using the braided wire, "SOLDER TAUL" Sony Part No. 7-641-300-81, remove the solder around the pins of the IC-chip to be removed.
2. While heating up the pins, remove the pins one by one using sharp-pointed tweezers.
3. Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
4. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
5. Place new chip part in the desired position and solder the pins.

SECTION 3
ELECTRICAL ALIGNMENTS

[Connections]



[Measuring Equipment]

- Oscilloscope (Textronix 2445 or equivalent)
- Frequency Counter
- Digital Voltmeter
- Signal Generator (Textronix TSG1411 or equivalent)
- Waveform Monitor
  (Textronix WFM-300A or equivalent)
- PFV-D50/D100/D200
- BKPF-102C/CA
- Extension Board: EX-331 (J-6185-960-J)

[Switch settting]

BKPF-131

S2/DEC-76 (A1): UNITY
S6/DEC-76 (A6): OFF

BKPF-102C

S102/DAC-6 (A6): YUV

BKPF-102CA

S102/DAC-11 (A8) : YUV
S105/DAC-11 (A10): CCIR

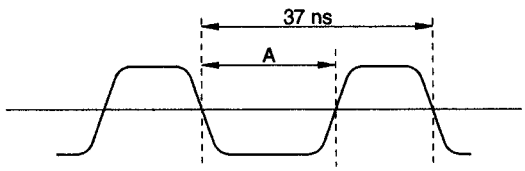
3-1. A/D REF VOLTAGE ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
• Extend DEC-76 board by EX-331 board. • Connect (+) of digital voltmeter to TP1/DEC-76 (D1) and (–) of that to E1/DEC-76 (C2).	TP1/DEC-76 (D1) –2.00±0.02 Vdc	⊘RV3/DEC-76 (E1)

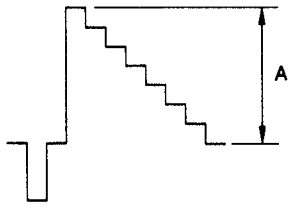
3-2. SERIAL OUT FREERUN ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
• Set S405/DEC-76 (G6) to ON. • Ocsilloscope CH2 : 0.5 V/DIV AC TIME: 20 ns/DIV TRIG: CH2 (TP402) • Connect frequency counter to CH2 OUT of oscilloscope. • After adjustment is completed, set S405/DEC-76 (G6) to OFF.	TP402/DEC-76 (G6) 26.9±0.1 MHz	⊘RV401/DEC-76 (F6)

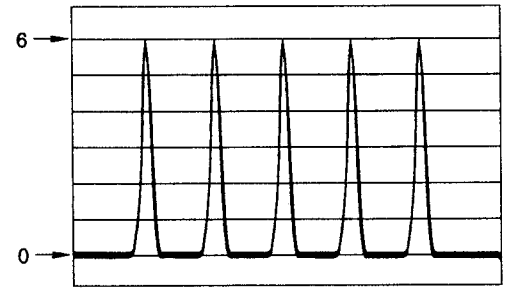
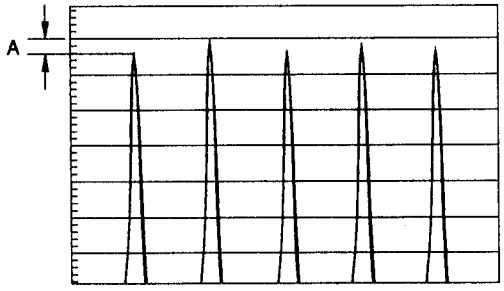
3-3. REF CLOCK DUTY ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
• Ocsilloscope CH2 : 1 V/DIV AC TIME: 5 ns/DIV TRIG: CH2 (TP501)	TP501/DEC-76 (D6)  A=23±1 ns	⊘RV404/DEC-76 (D6)

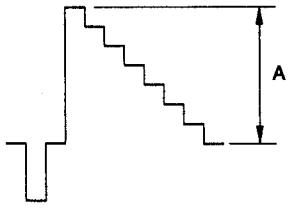
3-4. VIDEO LEVEL ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • Signal Generator Supply 100% color bars signal to ANALOG IN connector (BKPF-131P) . • Waveform monitor MODE: WAVEFORM INPUT: CH1 HORIZONAL: 2 LINE	ANALOG OUT Y/G connector (BKPF-102C/CA)  A=700±2 mVp-p	⊘RV2/DEC-76 (C2)

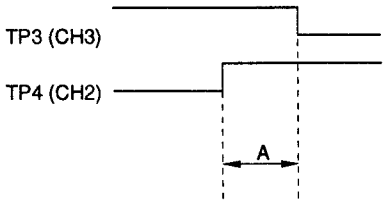
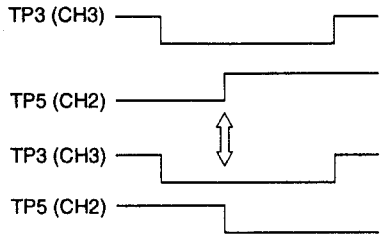
3-5. LINEARITY ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
STEP1 • S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • Supply 5-STEP to ANALOG IN connector (BKPF-131P) • Waveform Monitor MODE: WAVEFORM INPUT: CH1 VERTICAL FILTER: DIF'D	 The maximum peak point of five pulses should be set to 6-division.	⊘RV4/DEC-76 (D2)
STEP2 • Same setting as STEP1 • Waveform Monitor MODE: WAVEFORM INPUT: CH1 VERTICAL GAIN: ×5	 A ≤ 0.4 divisions (1.3%) The difference value of the maximum peak point and the minimum peak point should be less than 0.4 divisions.	
STEP3	Check the specification of section 3-4. VIDEO LEVEL ADJUSTMENT is met. When the specification of section 3-4 is not met, readjust sections 3-4 and 3-5.	

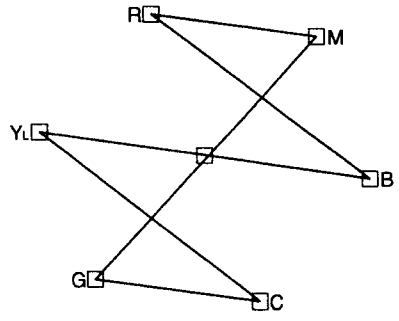
3-6. SYNC AGC ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
• Set S1/DEC-76 (A2) to AGC. • Signal generator Supply 100% color bars signal to ANALOG IN connector. • Waveform monitor MODE: WAVEFORM INPUT: CH1 HORIZONAL: 2 LINE • After adjustment is completed, set S1/DEC-76 (A2) to UNITY.	ANALOG OUT Y/G connector (BKPF-102C/CA)  A=700±2 mVp-p	⊘RV8/DEC-76 (B2)

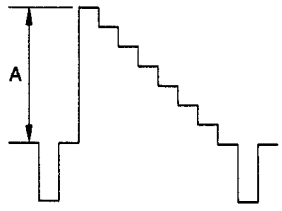
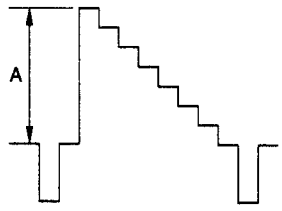
3-7. SCH ADJUSTMENT

Adjustment condition	Specifications	Adjustment points
STEP1 • Oscilloscope CH2 : 2 V/DIV CH3 : 0.5 V/DIV TIME : 10 µs/DIV DLAY : 50 ns/DIV TRIG : BLACK BURST (CH4) TRIG COUPLING: FLD1 FLD LINE: #9	CH2: TP4/DEC-76 (E1) CH3: TP3/DEC-76 (E2)  A=1580 ns	⊘RV7/DEC-76 (C3)
STEP2 Oscilloscope Same as STEP1	CH2: TP5/DEC-76 (E2) CH3: TP3/DEC-76 (E2)  • Turn ⊘RV7/DEC-76 (C3) gradually so that the waveform of TP5 is alternated periodically.	⊘RV7/DEC-76 (C3)
STEP3 • Reconnect CH2 to TP4.	• Check that the phase of waveform in STEP1 does not differ (When the phase of waveform in STEP1 differs after performing STEP2, reperform adjustments from STEP1.)	⊘RV7/DEC-76 (C3)

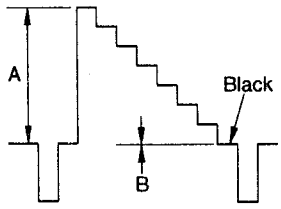
3-8. R–Y/B–Y (VECTOR MODE) LEVEL CHECK

Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • Supply 100% color bars to ANALOG IN connecotr. • Waveform Monitor MODE: VECOTOR NPUT : CH2, CH3	ANALOG OUT R-Y/R connector (BKPF-102C/CA) ANALOG OUT B-Y/B connector (BKPF-102C/CA)  Check that each luminescent spot should be within the target of the VECTOR graduation on the vector scope.	

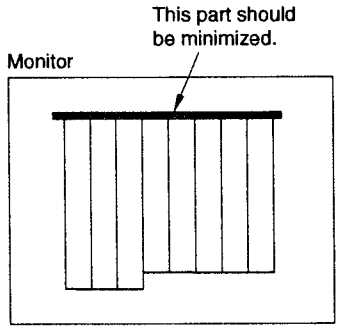
3-9. GAIN MANUAL MODE OPERATION CHECK

Adjustment condition	Specifications	Adjustment points
STEP1 • S1/DEC-76 (A2): MANUAL • S2/DEC-76 (A3): UNITY • RV1/DEC-76 (A1): Counterclockwise fully ↺ • Supply 100% color bars to ANALOG IN connector (BKPF-131P). • Disconnect a 75 Ω terminator from ANALOG IN LOOP THROUGH OUT connector (BKPF-131P). • Waveform MODE: WAVEFORM INPUT: CH1	ANALOG OUT Y/G connector (BKPF-102C/CA)  A≤700±5mVp-p	⊘RV1/DEC-76 (A1) Counterclockwise fully ↺
STEP2 • S1/DEC-76 (A2): MANUAL • S2/DEC-76 (A3): UNITY • RV1/DEC-76 (A1): Clockwise fully ↻ • Supply 100% color bars to ANALOG IN connector (BKPF-131P). • Connect two 75 Ω terminators to ANALOG IN LOOP THROUGH OUT connector (BKPF-131P). • Waveform Monitor MODE: WAVEFORM INPUT: CH1	ANALOG OUT Y/G connector (BKPF-102C/CA)  A≥700±5mVp-p	⊘RV1/DEC-76 (A1) Clockwise fully ↻

3-10. BLACK LEVEL MODE CHECK

Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): BLACK LEVEL CONT • Supply 100% color bars to ANALOG IN connector (BKPF-131P). • Waveform Monitor MODE: WAVEFORM INPUT: CH1	ANALOG OUT Y/G connector (BKPF-102C/CA)  ① When rotating ⊘RV602 clockwise fully Ω B≥125 mV ② When rotating ⊘RV602 counterclockwise fully Ω A≤630 mV	⊘RV602/DEC-76 (A2)

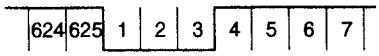
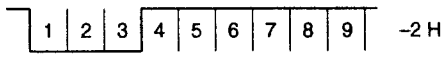
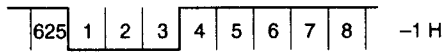
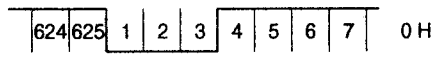
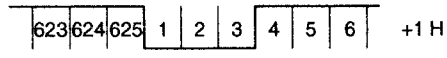
3-11. FREEZE MODE CHECK

Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • S6/DEC-76 (A6): ON D301 (green) should be lit when S6 is set to ON. • S601-1/DEC-76 (B9): OFF (AUTO FREEZE OFF) • Supply 100% color bars to ANALOG IN connector (BKPF-131P). • Waveform Monitor MODE: WAVEFORM INPUT: CH1 • Monitor NARROW SCAN • After S6 is set to ON, no signal is supplied ANALOG IN connector.	ANALOG OUT Y/G connector (BKPF-102C/CA) ① When setting S5 to FRAME The color bars on the screen should not be disappered. ② When setting S5 to FIELD The level difference of the upper picture should be minimized. (The only odd field should be appeared.) 	

3-12. AUTO FREEZE MODE CHECK

Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • S6/DEC-76 (A6): OFF • S601-1/DEC-76 (B9): ON • Supply 100% color bars to ANALOG IN connector (BKPF-131P). • Monitor NARROW SCAN	The picture should not be disappeared, when supplying no signl to ANALOG IN connector. At this time, D606/D608 (red) and D301 (green) should be lit.	

3-13. SYSTEM DELAY CHECK (1)

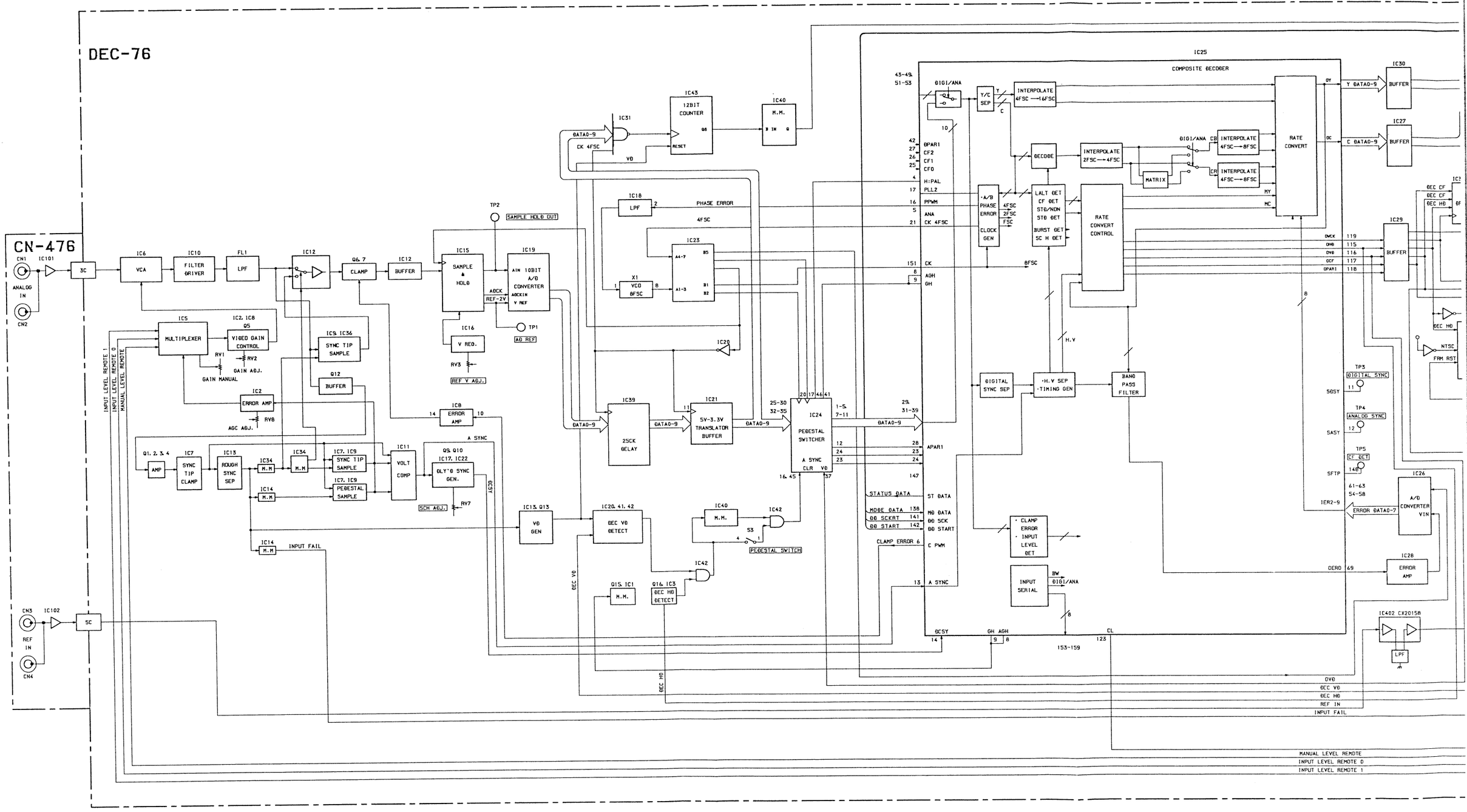
Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • Supply 100% color bars to ANALOG IN connector (BKF-131P). • Oscilloscope CH1: BKPF-102C/CA Y/G OUT CH4: TSG1411 B. B TRIGGER SOURCE: CH4 TRIGGER MODE: TV FIELD1 TIME: 1 msec/DIV	S401-1 and S401-2 are set to the following settings. At this time, relationship between the phase of BKPF-102C/CA ANALOG OUT Y/G connector output and the phase of the signal generator (TSG1411) output are shown below.	S401-1/DEC-76 (E6) S401-2/DEC-76 (E6)
	TSG1411 (CH4) 	
	① When setting S401-1 and S401-2 to ON Y/G OUT (CH1) 	
	② When setting S401-1 to ON and S401-2 to OFF Y/G OUT (CH1) 	
	③ When setting S401-1 to OFF and S401-2 to ON Y/G OUT (CH1) 	
	④ When setting S401-1 and S401-2 to OFF Y/G OUT (CH1) 	

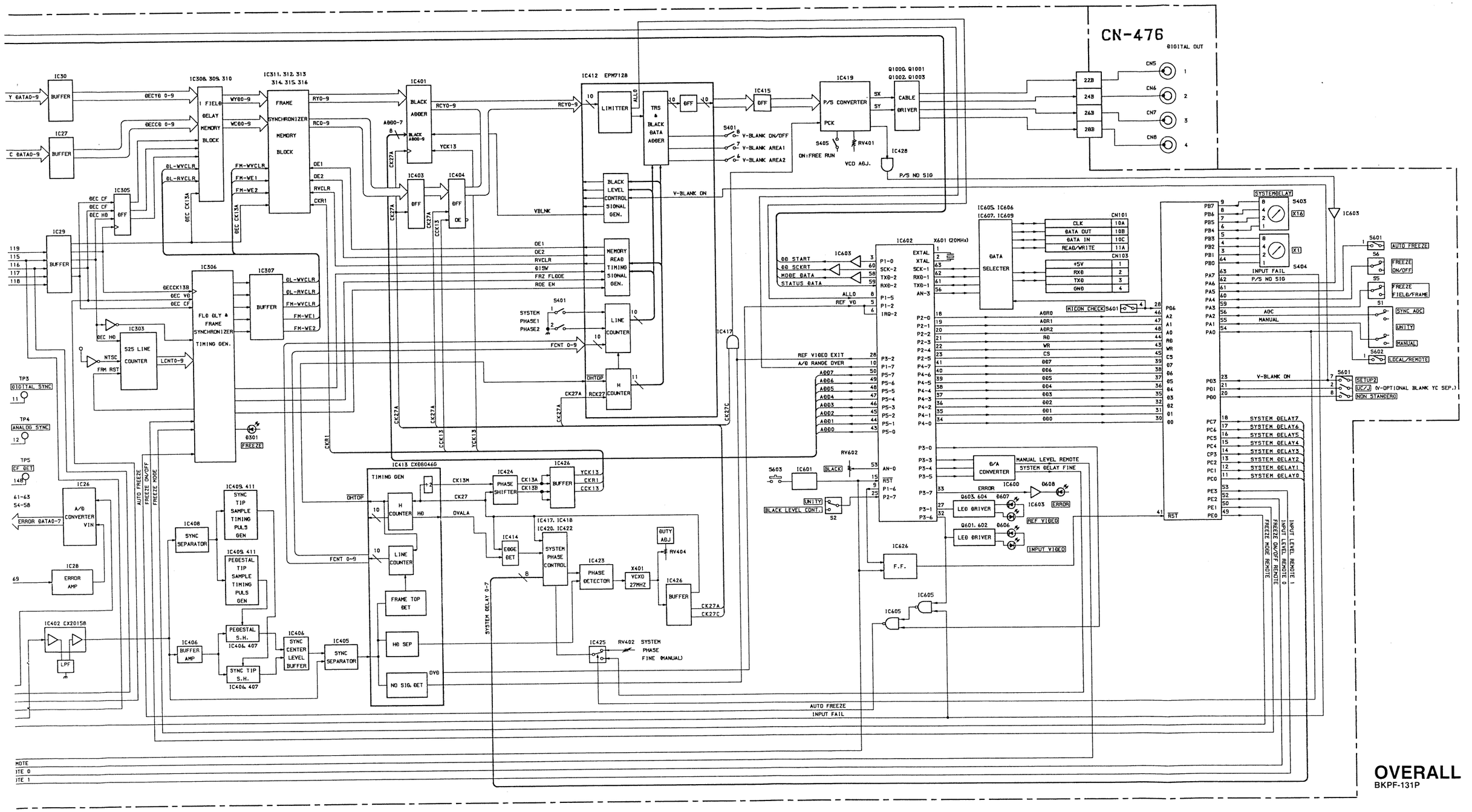
3-14. SYSTEM DELAY CHECK (2)

Adjustment condition	Specifications	Adjustment points
• S1/DEC-76 (A2): UNITY • S2/DEC-76 (A3): UNITY • Supplly 100% color bars to ANALOG IN connector (BKPF-131P). • Oscilloscope CH1: BKPF-102C/CA Y/G OUT CH4: TSG1411 B. B TRIGGER SOURCE: CH4 TRIGGER MODE: TV LINE	① When rotating S403 from "0" to "F" The phase of BKPF-102C/CA ANALOG OUT Y/G connector output should be delayed 592 nsec steps.	S403/DEC-76 (A4)
	② When rotating S404 from "0" to "F" The phase of BKPF-102C/CA ANALOG OUT Y/G connector output should be delayed 37 nsec steps on condition that S403 is set to "8".	S404/DEC-76 (A4)
	③ When rotaing ⊘RV402 from counterclockwise fully to clockwise fully ↻ The phase of BKPF-102C/CA Y/G ANALOG OUT connector output should be delayed more than 40 nsec.	⊘RV402/DEC-76 (A4)

SECTION 4
BLOCK DIAGRAM

OVERALL





OVERALL
BKPF-131P

SECTION 5
SEMICONDUCTOR PIN ASSIGNMENTS

ICs, transistors and diodes whoses functions are equivalent are described here. Therefore, incompatible device names may be described together. For parts replacement, refer to the Spare Parts section in this manual.

DIODE	PAGE
1S1587	5-2
1S2836	5-2
1SS120	5-2
1SS226	5-2
1SS303	5-2
LN15BP	5-2
LN25RP	5-2
LN35BP	5-2
RD??M	5-2
RD??M-B?	5-2
TLR224	5-2

TRANSISTOR	PAGE
2SA1162G	5-2
2SA1175	5-2
2SA1611	5-2
2SC1623	5-2
2SC3053	5-2
2SC3356	5-2
2SK852-X2	5-2
DTC114EK	5-2
DTC114EU	5-2

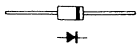
IC	PAGE
74AC04SJ	5-3
74AC574SJ	5-3
74ACT163SJ	5-3
74F00SJ	5-3
74F04SJ	5-3
74F74SJ	5-4
CLC520AJE	5-4
CX20158	5-4
CX20194	5-4
CX23065A	5-4
CXA1496AQ	5-5
CXA1693Q	5-5
CXD1095Q	5-6
CXD1175AM	5-6
CXD8046G	5-7
CXD8819AQ	5-8
CXD8860Q	5-10
CXK1203Q	5-7
CXK48324R	5-9
EPM7032LC44-3	5-10
EPM7128LC84-15	5-11
HA3-5033-5	5-12
HD14053BFP	5-12
HD6475208P-10	5-12
IDT74FCT821ATSO	5-13
IDT74FCT827ATSO	5-12
LM1881M	5-13
LM317LZ	5-14
LM317T	5-14
LT1191CS8	5-14
M5237ML	5-14
MB88346BPFV	5-14
MC14052BF	5-14
MC14053BF	5-12
MC34182M	5-14

IC	PAGE
MC34184M	5-14
MC74HC133F	5-14
MC74HC4040F	5-15
NJM360M	5-15
SBX1601A	5-15
SN74HC00ANS	5-15
SN74HC08ANS	5-15
SN74HC125ANS	5-15
SN74HC4040ANS	5-15
SN74HC541ANS	5-15
SN74HC74ANS	5-16
SN74HC86ANS	5-3
SN74HCT244ANS	5-16
SN74HCT540ANS	5-16
SN74LS221NS	5-16
SN74LS85NS	5-16
TC74HC123AF	5-17
TC74HC133AF	5-14
TC74HC221AF	5-17
TC74HC86AF	5-3
TC7S08F	5-17
TL082CPS	5-14
TL082M	5-14
TL084CNS	5-17
TL7705CPS-B	5-17
UPC319G2	5-17

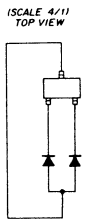
The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

IODE, TRANSISTOR

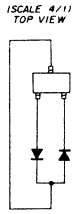
DIODE



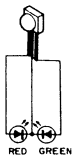
1S1587
1SS120



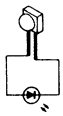
1S2836
1SS303



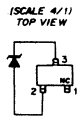
1SS226



LN15BP

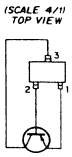


LN25RP ; RED
LN35BP ; GREEN
TLR224 ; RED

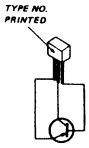


RD ? ?M
RD ? ?M-B ?

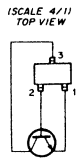
TRANSISTOR



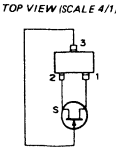
2SA1162G
2SA1611



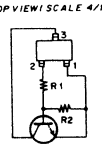
2SA1175



2SC1623
2SC3053
2SC3356



2SK852-X2

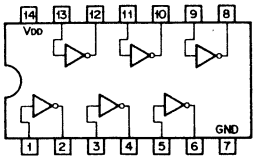


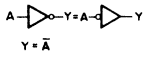
DTC114EK (R1 = 10K, R2 = 10K)
DTC114EU (R1 = 10K, R2 = 10K)

IC

74AC04SJ (NS) FLAT PACKAGE

C-MOS HEX INVERTERS
– TOP VIEW –





A	Y
0	1
1	0

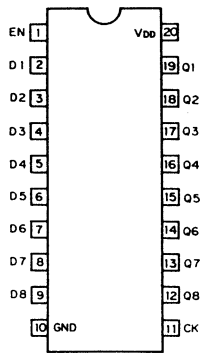
0 ; LOW LEVEL
1 ; HIGH LEVEL

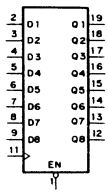
NOTE :

TYPE	VDD
74HCT04 TYPE	+ 5V
TC74AC04 TYPE TC74VHC04 TYPE	+ 2 to + 5.5V
74ACT04 TYPE	+ 4.5 to + 5.5V
OTHER TYPES	+ 2 to + 6V

74AC574SJ (NS) FLAT PACKAGE

C-MOS 3-STATE D-TYPE EDGE-TRIGGERED FLIP-FLOP
– TOP VIEW –

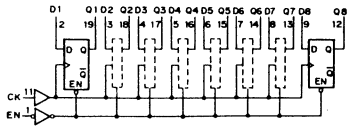




EACH FLIP-FLOP

INPUTS			OUT
EN	CK	D	Q
0	↑	1	1
0	↑	0	0
0	↓	X	Q0
1	X	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE
Q0 ; NO CHANGE

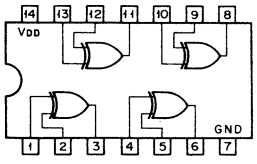


NOTE :

TYPE	VDD
74AC/74HC	+ 2 to + 6V
74ACT/74FCT /74HCT	+ 5V
TC74AC574F TC74VHC574	+ 2 to + 5.5V

SN74HC86ANS (TI) FLAT PACKAGE
TC74HC86AF (TOSHIBA) FLAT PACKAGE

C-MOS QUAD EXCLUSIVE OR GATES
– TOP VIEW –



A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

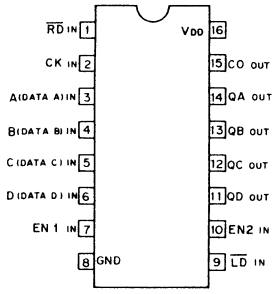
0;LOW LEVEL
1;HIGH LEVEL

NOTE :

TYPE	VDD
TC74AC86 TYPE	+2 to +5.5V
OTHER TYPES	+2 to +6V

74ACT163SJ (NS) FLAT PACKAGE

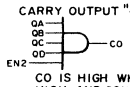
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER
– TOP VIEW –



MODE SELECTION

CONTROL INPUTS				MODE
RD	LD	EN1	EN2	
0	X	X	X	RESET (SYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

CARRY OUTPUT "CO"



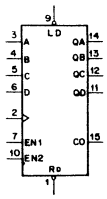
CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS "15".

NOTE :

TYPE	VDD
74ACT163 TYPE IDT74FCT163 TYPE	+ 5V
TC74AC163 TYPE	+ 2 to + 5.5V
OTHER TYPES	+ 2 to + 6V

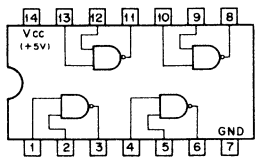
COUNT SEQUENCE

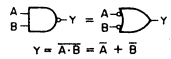
COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1



74F00SJ (NS) FLAT PACKAGE

TTL 2-INPUT POSITIVE-NAND GATE
– TOP VIEW –



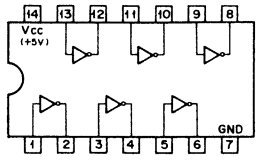


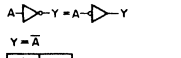
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0;LOW LEVEL
1;HIGH LEVEL

74F04SJ (NS) FLAT PACKAGE

TTL INVERTER
– TOP VIEW –



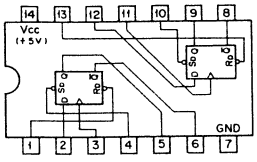


A	Y
0	1
1	0

0;LOW LEVEL
1;HIGH LEVEL

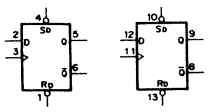
74F74SJ (NS) FLAT PACKAGE

TTL D-TYPE FLIP FLOP WITH DIRECT SET/RESET
- TOP VIEW -



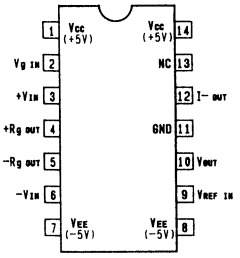
INPUTS				OUTPUTS	
$\overline{S_D}$	$\overline{R_D}$	CK	D	Qn+1	$\overline{Q_{n+1}}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1*	1*
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	0	X	Qn	$\overline{Q_n}$

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE
1*; NONSTABLE

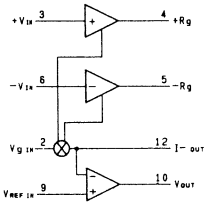


CLC520AJE (COMLINEAR) FLAT PACKAGE

WIDEBAND AMP WITH VOLTAGE CONTROLLED GAIN
- TOP VIEW -

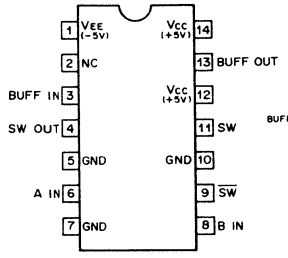


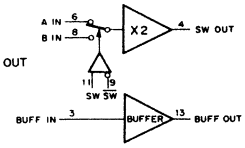
+VIN,-VIN ; SIGNAL INPUT
Vg ; GAIN CONTROL VOLTAGE
+Rg,-Rg ; GAIN SETTING RESISTOR
I- OUT ; FEED BACK
VOUT ; SIGNAL OUTPUT
VREF IN ; OFFSET ADJUSTMENT



CX20158 (SONY) FLAT PACKAGE

VIDEO SWITCHER AND BUFFER
- TOP VIEW -



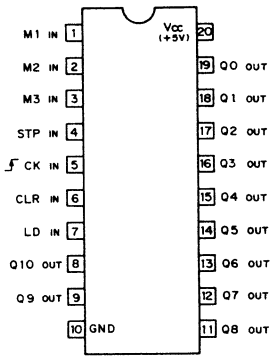


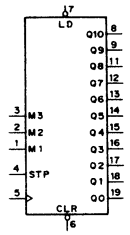
SW	$\overline{SW}$	INPUT
0	0	—
0	1	B
1	0	A
1	1	—

0; LOW LEVEL
1; HIGH LEVEL
—; INDEFINITE

CX20194 (SONY)

BIPOLAR 11-BIT SYNCHRONOUS BINARY COUNTER
- TOP VIEW -

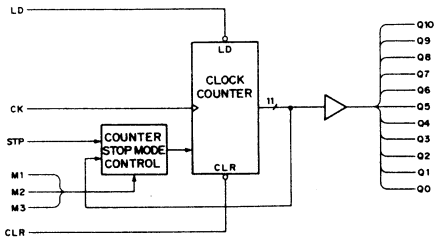




M3	M2	M1	COUNT*
0	0	0	909
0	0	1	910
0	1	0	1024
0	1	1	1135
1	0	0	525
1	0	1	625
1	1	0	1125
1	1	1	2048

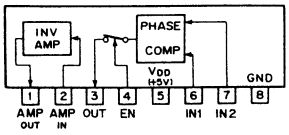
*; DECIMAL NUMBER
0; LOW LEVEL
1; HIGH LEVEL

M1,M2,M3; COUNT LIMIT SETTING SIGNAL INPUT
STP; COUNTER STOP MODE CONTROL INPUT
CLR; SYNCHRONOUS COUNTER CLEAR INPUT
LD; ASYNCHRONOUS COUNTER LOAD INPUT



CX23065A (SONY)

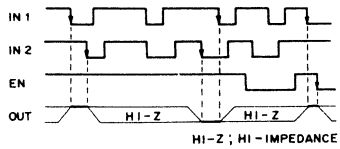
N-MOS PHASE COMPARATOR WITH INVERSION AMPLIFIER
- PRINTED SIDE VIEW -



EN	OUT
1	ACTIVE
0	HIGH IMPEDANCE

1; HIGH LEVEL
0; LOW LEVEL

TIMING CHART

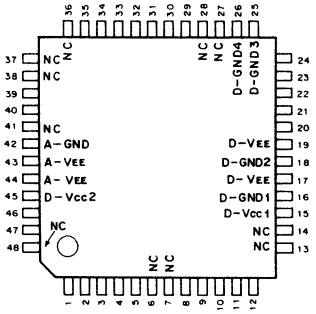


HI-Z ; HI-IMPEDANCE

CXA1496AQ (SONY) FLAT PACKAGE

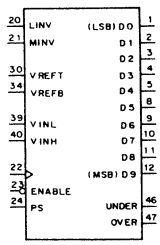
10-BIT 20MSPS A/D CONVERTER

– TOP VIEW –



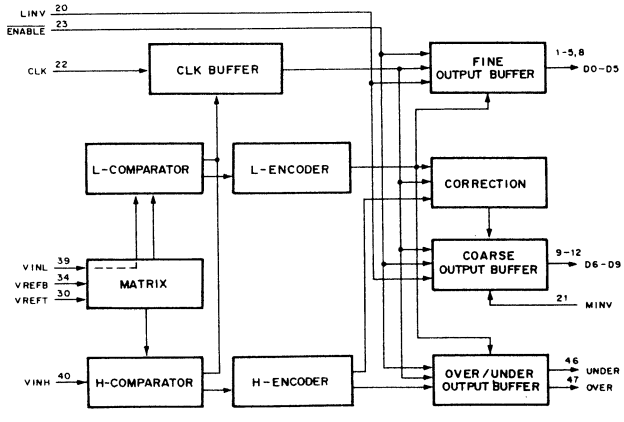
D-Vcc = + 5V
D-VEE = – 5V
A-VEE = – 5V

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	O	D0 (LSB)	13	–	NC	25	–	D-GND3	37	–	NC
2	O	D1	14	–	NC	26	–	D-GND4	38	–	NC
3	O	D2	15	–	D-Vcc1	27	–	NC	39	I	VINL
4	O	D3	16	–	D-GND1	28	–	NC	40	I	VINH
5	O	D4	17	–	D-VEE	29	–	V REFTS	41	–	NC
6	–	NC	18	–	D-GND2	30	I	V REFT	42	–	A-GND
7	–	NC	19	–	D-VEE	31	–	V REF1	43	–	A-VEE
8	O	D5	20	I	LINV	32	–	V REF2	44	–	A-VEE
9	O	D6	21	I	MINV	33	–	V REF3	45	–	D-Vcc2
10	O	D7	22	I	CLK	34	I	V REFB	46	O	UNDER
11	O	D8	23	I	ENABLE	35	–	V REFBS	47	O	OVER
12	O	D9 (MSB)	24	I	PS	36	–	NC	48	–	NC



INPUT
CLK ; DIA CONVERSION CLOCK
ENABLE ; 3-STATE CONTROL (LOW : ENABLE)
LINV ; INVERSE CONTROL OF D8 – D0 DIGITAL OUTPUT
MINV ; INVERSE CONTROL OF D9 DIGITAL OUTPUT
PS ; POWER SAVE CONTROL
VINH ; ANALOG IN (HIGH)
VINL ; ANALOG IN (LOW)
VREFB ; REFERENCE VOLTAGE FORCE (BOTTOM)
VREFT ; REFERENCE VOLTAGE FORCE (TOP)

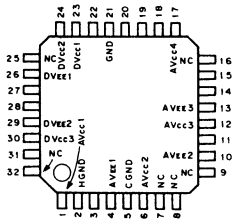
OUTPUT
D0 – D9 ; DIGITAL OUT
OVER ; OVER FLOW OUT
UNDER ; UNDER FLOW OUT

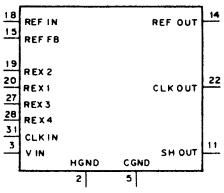


CXA1693Q (SONY)

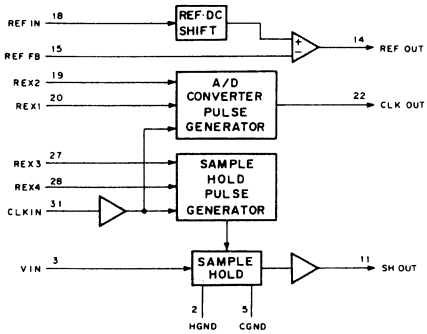
HIGH SPEED SAMPLE HOLD

– TOP VIEW –





PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	–	AVcc1 (+ 5V)	17	–	AVcc4 (+ 5V)
2	–	HGND	18	I	REFIN
3	I	VIN	19	I	REX2
4	–	AVEE1 (– 5V)	20	I	REX1
5	–	CGND	21	–	GND
6	–	AVcc2 (+ 5V)	22	O	CLKOUT
7	–	NC	23	–	DVcc1 (+ 5V)
8	–	NC	24	–	DVcc2 (+ 5V)
9	–	NC	25	–	NC
10	–	AVEE2 (– 5V)	26	–	DVEE1 (– 5V)
11	O	SHOUT	27	I	REX3
12	–	AVcc3 (+ 5V)	28	I	REX4
13	–	AVEE3 (– 5V)	29	–	DVEE2 (– 5V)
14	O	REFOUT	30	–	DVcc3 (+ 5V)
15	I	REFFB	31	I	CLKIN
16	–	NC	32	–	NC



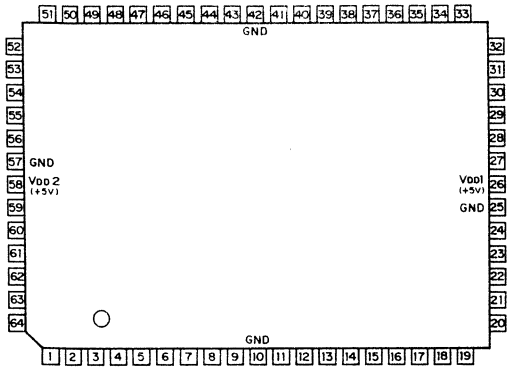
INPUT
CLKIN ; CLOCK
REFFB ; EXTERNAL TRANSISTOR (PNP) EMITTER CONNECTION FOR – 2V REG OUT
REFIN ; – 2V REG ADJUSTMENT
REX1 ; DELAY TIME SET FOR A/D CONVERTER CLOCK
REX2 ; WIDTH TIME SET FOR A/D CONVERTER CLOCK
REX3 ; DELAY TIME SET FOR SAMPLE HOLD CLOCK
REX4 ; WIDTH TIME SET FOR SAMPLE HOLD CLOCK
VIN ; INPUT VOLTAGE OF SAMPLE HOLD

OUTPUT
CLKOUT ; CLOCK FOR A/D CONVERTER
REFOUT ; EXTERNAL TRANSISTOR (PNP) BASE CONNECTION FOR – 2V REG OUT
SHOUT ; OUTPUT VOLTAGE OF SAMPLE HOLD

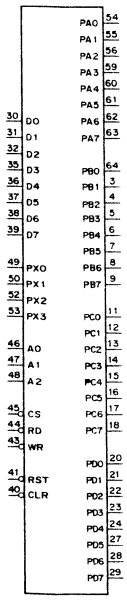
CXD1095Q (SONY) FLAT PACKAGE

C-MOS I/O PORT EXPANDER

– TOP VIEW –



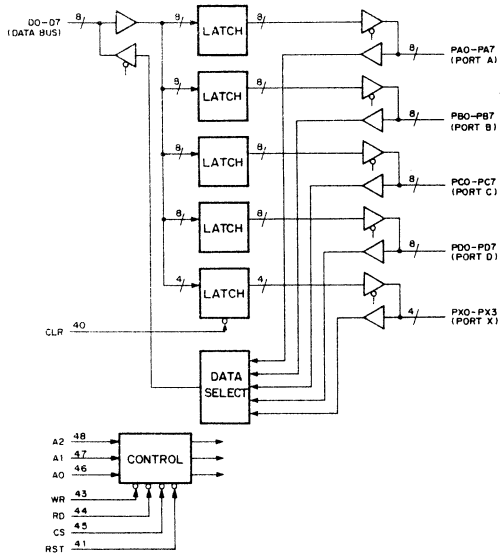
PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL
1			NC	17	O	O	PC6	33			NC	49	O	O	PX0
2			NC	18	O	O	PC7	34			NC	50	O	O	PX1
3	O	O	PB1	19			NC	35	O	O	D3	51			NC
4	O	O	PB2	20	O	O	PD0	36	O	O	D4	52	O	O	PX2
5	O	O	PB3	21	O	O	PD1	37	O	O	D5	53	O	O	PX3
6	O	O	PB4	22	O	O	PD2	38	O	O	D6	54	O	O	PA0
7	O	O	PB5	23	O	O	PD3	39	O	O	D7	55	O	O	PA1
8	O	O	PB6	24	O	O	PD4	40	O		CLR	56	O	O	PA2
9	O	O	PB7	25			GND	41	O		RST	57			GND
10			GND	26	O		VDD (+5V)	42			GND	58	O		VDD (+5V)
11	O	O	PC0	27	O	O	PD5	43	O		WR	59	O	O	PA3
12	O	O	PC1	28	O	O	PD6	44	O		RD	60	O	O	PA4
13	O	O	PC2	29	O	O	PD7	45	O		CS	61	O	O	PA5
14	O	O	PC3	30	O	O	D0	46	O		A0	62	O	O	PA6
15	O	O	PC4	31	O	O	D1	47	O		A1	63	O	O	PA7
16	O	O	PC5	32	O	O	D2	48	O		A2	64	O	O	PB0



CS	RD	WR	A2	A1	A0	MODE
0	0	1	0	0	0	PORT A → DATA BUS
0	0	1	0	0	1	PORT B → DATA BUS
0	0	1	0	1	0	PORT C → DATA BUS
0	0	1	0	1	1	PORT D → DATA BUS
0	0	1	1	0	0	PORT X → DATA BUS
0	0	1	1	0	1	——
0	0	1	1	1	0	——
0	0	1	1	1	1	——
0	1	0	0	0	0	DATA BUS → PORT A
0	1	0	0	0	1	DATA BUS → PORT B
0	1	0	0	1	0	DATA BUS → PORT C
0	1	0	0	1	1	DATA BUS → PORT D
0	1	0	1	0	0	DATA BUS → PORT X
0	1	0	1	0	1	——
0	1	0	1	1	0	DATA BUS → CTL REG.1
0	1	0	1	1	1	DATA BUS → CTL REG.2
1	X	X	X	X	X	DATA BUS ; HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

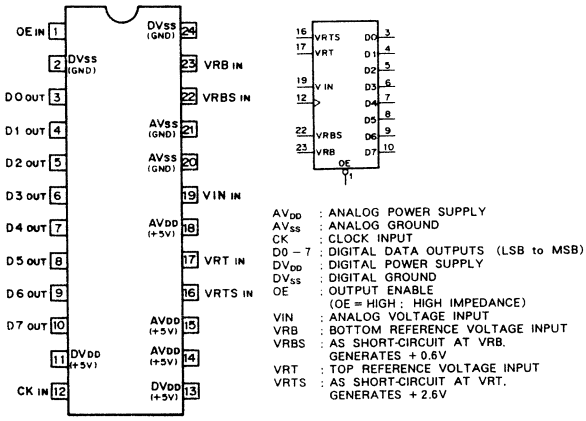
D0–D7 ; DATA BUS INPUTS/OUTPUTS
CS ; CHIP SELECT INPUT
RD ; READ STROBE INPUT
WR ; WRITE STROBE INPUT
A0–A2 ; ADDRESS INPUT
RST ; RESET INPUT
CLR ; CLEAR INPUT
PA0–PA7 ; PORT A INPUTS/OUTPUTS
PB0–PB7 ; PORT B INPUTS/OUTPUTS
PC0–PC7 ; PORT C INPUTS/OUTPUTS
PD0–PD7 ; PORT D INPUTS/OUTPUTS
PX0–PX3 ; PORT X INPUTS/OUTPUTS



CXD1175AM (SONY) FLAT PACKAGE

C-MOS 8-BIT 20MSPS VIDEO A/D CONVERTER

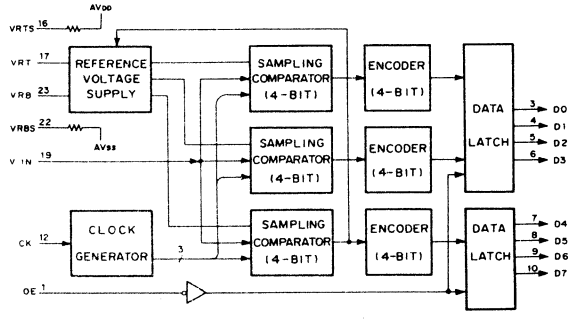
– TOP VIEW –



AV_{DD} : ANALOG POWER SUPPLY
AV_{SS} : ANALOG GROUND
CK : CLOCK INPUT
D0 – 7 : DIGITAL DATA OUTPUTS (LSB to MSB)
DV_{DD} : DIGITAL POWER SUPPLY
DV_{SS} : DIGITAL GROUND
OE : OUTPUT ENABLE
(OE = HIGH ; HIGH IMPEDANCE)
VIN : ANALOG VOLTAGE INPUT
VRB : BOTTOM REFERENCE VOLTAGE INPUT
VRBS : AS SHORT-CIRCUIT AT VRB.
GENERATES + 0.6V
VRT : TOP REFERENCE VOLTAGE INPUT
VRTS : AS SHORT-CIRCUIT AT VRT.
GENERATES + 2.6V

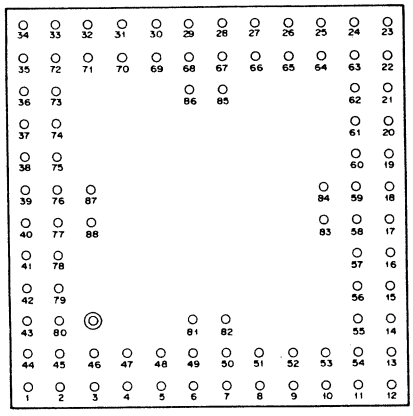
STEP	INPUT SIGNAL VOLTAGE	DATA OUTPUTS D7	D6	D5	D4	D3	D2	D1	D0
0	0V (VRT)	1	1	1	1	1	1	1	1
1	0.01V	1	1	1	1	1	1	1	0
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
127	1.34V	1	0	0	0	0	0	0	0
128	1.35V	0	1	1	1	1	1	1	1
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
255	2.7V (VRB)	0	0	0	0	0	0	0	0

0 : LOW LEVEL
1 : HIGH LEVEL



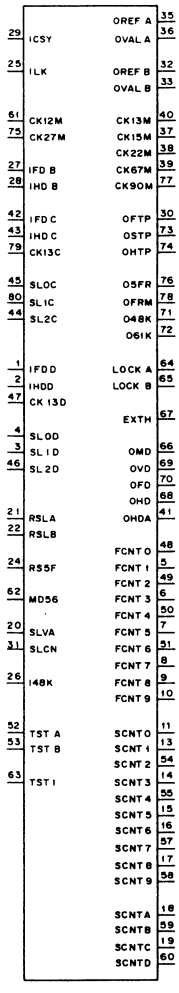
CXD8046G (SONY)

C-MOS GATE ARRAY
– BOTTOM VIEW –



(VDD = 5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	IFDD	23	–	N.C	45	I	SL0C	67	O	EXTH
2	I	IHDD	24	I	RS5F	46	I	SL2D	68	O	OHD
3	I	SL1D	25	I	ILK	47	I	CK13D	69	O	OVD
4	I	SL0D	26	I	I48K	48	O	FCNT0	70	O	OFD
5	O	FCNT1	27	I	IFDB	49	O	FCNT2	71	O	O48K
6	O	FCNT3	28	I	IHDB	50	O	FCNT4	72	O	O61M
7	O	FCNT5	29	I	ICSY	51	O	FCNT6	73	O	OSTP
8	O	FCNT7	30	O	OFTP	52	I	TSTA	74	O	OHTP
9	O	FCNT8	31	I	SLCN	53	I	TSTB	75	I	CK27M
10	O	FCNT9	32	O	OREFB	54	O	SCNT2	76	O	O5FR
11	O	SCNT0	33	O	OVALB	55	O	SCNT4	77	O	CK90M
12	–	GND	34	–	GND	56	–	N.C	78	O	OFRM
13	O	SCNT1	35	O	OREFA	57	O	SCNT7	79	I	CK13C
14	O	SCNT3	36	O	OVALA	58	O	SCNT9	80	I	SL1C
15	O	SCNT5	37	O	CK15M	59	O	SCNTB	81	–	GND
16	O	SCNT6	38	O	CK22M	60	O	SCNTD	82	–	VDD
17	O	SCNT8	39	O	CK67M	61	I	CK12M	83	–	VDD
18	O	SCNTA	40	O	CK13M	62	I	MD56	84	–	GND
19	O	SCNTC	41	O	OHDA	63	I	TST1	85	–	GND
20	I	SLVA	42	I	IFDC	64	O	LOCKA	86	–	VDD
21	I	RSLA	43	I	IHDC	65	O	LOCKB	87	–	VDD
22	I	RSLB	44	I	SL2C	66	O	OMD	88	–	GND



INPUT

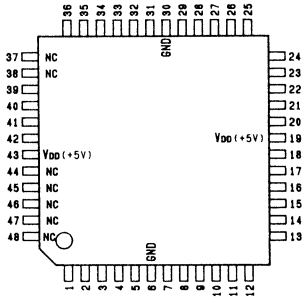
CK12M	; AUDIO 12.288MHz CLOCK
CK13C	; CLOCK FOR REFERENCE INPUT C
CK13D	; CLOCK FOR REFERENCE INPUT D
CK27M	; VIDEO 27.0MHz CLOCK
I48K	; AUDIO 48kHz INPUT
ICSY	; COMPOSITE SYNC INPUT
IFDB	; FRAME PULSE OF REFERENCE INPUT B
IFDC	; FRAME PULSE OF REFERENCE INPUT C
IFDD	; FRAME PULSE OF REFERENCE INPUT D
IHDB	; H SYNC PULSE OF REFERENCE INPUT B
IHDC	; H SYNC PULSE OF REFERENCE INPUT C
IHDD	; H SYNC PULSE OF REFERENCE INPUT D
ILK	; INHIBITION OF AUDIO PLL REFERENCE
MD56	; 525/625 SYSTEM MODE
RS5F	; AUDIO 5 FRAME RESET INPUT
RSLA, RSLB	; REFERENCE INPUT SELECT CONTROL
SL0C – SL2C	; DELAY CONTROL OF REFERENCE INPUTS C
SL0D – SL2D	; DELAY CONTROL OF REFERENCE INPUTS D
SLCN	; SEGMENT/HORIZONTAL COUNT SELECT CONTROL
SLVA	; VIDEO/AUDIO REFERENCE SELECT
TST1	; TEST USE
TSTA, TSTB	; TEST USE

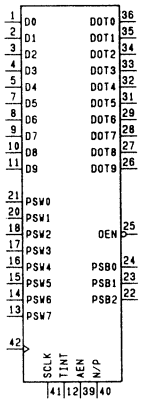
OUTPUT

CM13M	; 13.5MHz CLOCK
CK15M	; 1.5MHz CLOCK
CK22M	; 2.25MHz CLOCK
CK67M	; 6.75MHz CLOCK
CK90M	; 9.0MHz CLOCK
EXTH	; REFERENCE INPUT DETECT
FCNT0 – FCNT9	; FRAME COUNT OUTPUTS (FCNT9 : MSB)
LOCK A, LOCK B	; LOCK STATE OUTPUTS OF PLL A (VIDEO), PLL B (AUDIO)
O48K	; 48kHz OUTPUT
O5FR	; AUDIO 5 FRAME OUTPUT
O61M	6.144MHz OUTPUT
OFD	; FRAME PULSE OF SELECTED REFERENCE
OFRM	; FRAME PULSE
OFTP	; FRAME TOP PULSE
OHD	; H SYNC PULSE OF SELECTED REFERENCE
OHDA	; H SYNC PULSE
OHTP	; H SYNC TOP PULSE
OMD	; DETECTED 525/625 SYSTEM MODE
OREFA, OREFB	; REFERENCE PULSE OF PLL A, PLL B
OSTP	; SEGMENT/HORIZONTAL COUNT TOP PULSE
OVALA, OVALB	; VALIABLE PULSE OF PLL A, PLL B
OVD	; V PULSE OF COMPOSITE SYNC INPUT
SCNT0 – SCNT9	; SEGMENT/HORIZONTAL COUNTER OUTPUTS
SCNTA – SCNTD	; SEGMENT/HORIZONTAL COUNTER OUTPUTS (SCNTD : MSB)

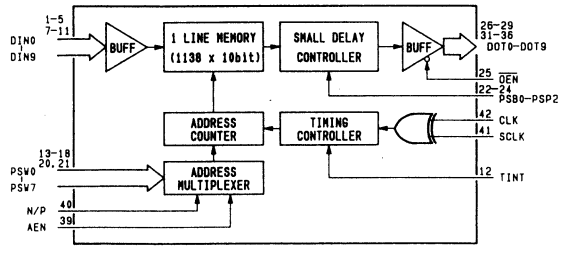
CXK1203Q (SONY)

C-MOS DIGITAL LINE MEMORY
– TOP VIEW –





AEN	;LINE MEMORY SELECT
CLK	;CLOCK
DIN0–DIN9	;VIDEO DATA INPUT
DOT0–DOT9	;VIDEO DATA OUTPUT
N/P	;NTSC/PAL/SECAM SELECT
OEN	;OUTPUT ENABLE
PSB0–PSB2	;DELAY STEP SELECT(1 BITxN)
PSW0–PSW7	;DELAY STEP SELECT(8 BITxN)
SCLK	;CLOCK EDGE SELECT
TINT	;TEST



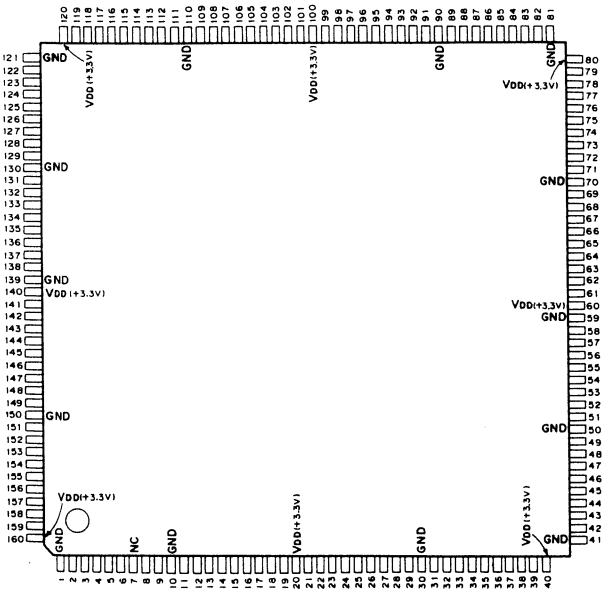
(VDD = + 5V)

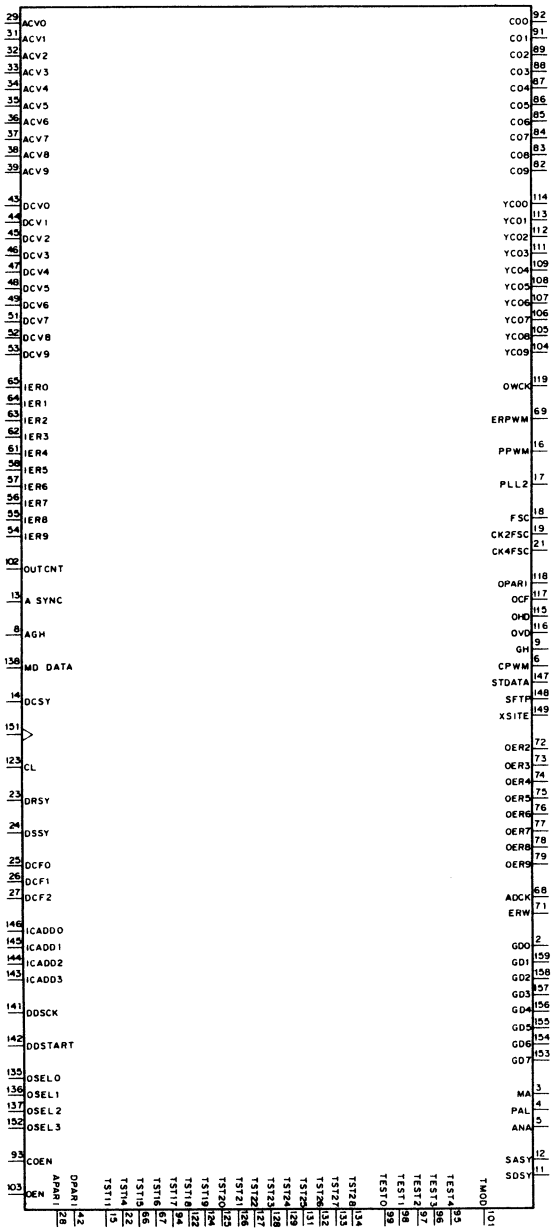
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGANL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	D0	13	I	PSW7	25	I	OEN	37	–	N.C
2	I	D1	14	I	PSW6	26	O	DOT9	38	–	N.C
3	I	D2	15	I	PSW5	27	O	DOT8	39	I	AEN
4	I	D3	16	I	PSW4	28	O	DOT7	40	I	N/P
5	I	D4	17	I	PSW3	29	O	DOT6	41	I	SCLK
6	–	GND	18	I	PSW2	30	–	GND	42	I	CLK
7	I	D5	19	–	VDD	31	O	DOT5	43	–	VDD
8	I	D6	20	I	PSW1	32	O	DOT4	44	–	N.C
9	I	D7	21	I	PSW0	33	O	DOT3	45	–	N.C
10	I	D8	22	I	PSB2	34	O	DOT2	46	–	N.C
11	I	D9	23	I	PSB1	35	O	DOT1	47	–	N.C
12	I	TINT	24	I	PSB0	36	O	DOT0	48	–	N.C

CXD8819AQ (FUJITSU)

C-MOS DIGITAL VIDEO SIGNAL DECODER

– TOP VIEW –





(V_{DD} = + 3.3 V)

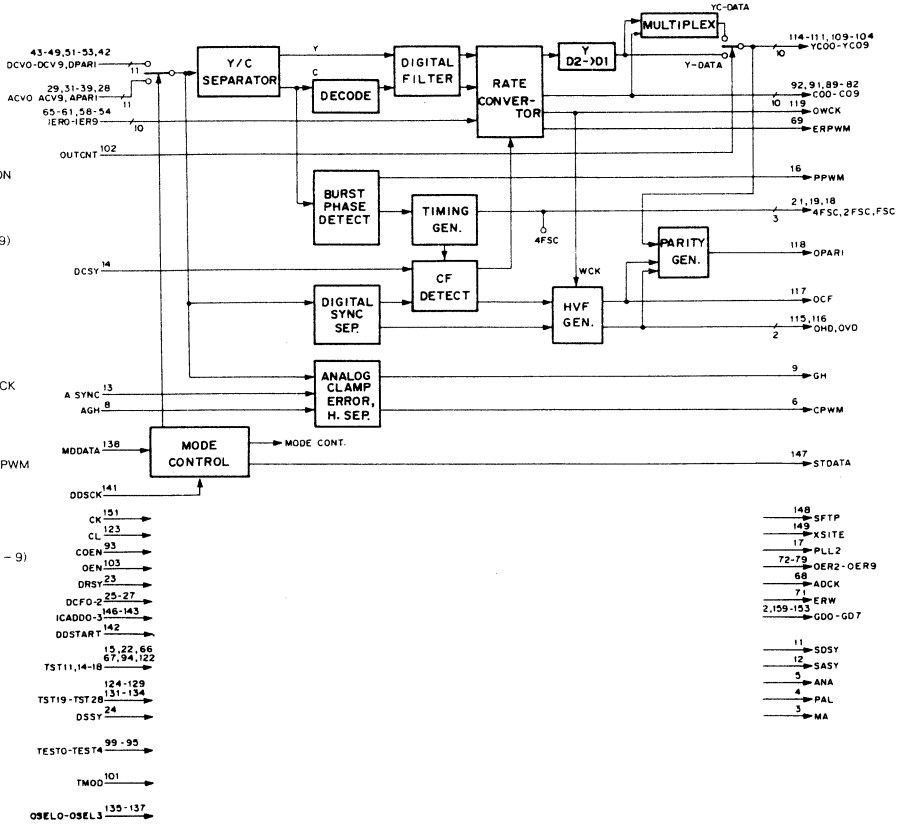
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	–	GND	41	–	GND	81	–	GND	121	–	GND
2	O	GD0	42	I	DPARI	82	O	CO9	122	I	TST18
3	O	MA	43	I	DCV0	83	O	CO8	123	I	CL
4	O	PAL	44	I	DCV1	84	O	CO7	124	I	TST19
5	O	ANA	45	I	DCV2	85	O	CO6	125	I	TST20
6	O	CPWM	46	I	DCV3	86	O	CO5	126	I	TST21
7	–	NC	47	I	DCV4	87	O	CO4	127	I	TST22
8	I	AGH	48	I	DCV5	88	O	CO3	128	I	TST23
9	O	GH	49	I	DCV6	89	O	CO2	129	I	TST24
10	–	GND	50	–	GND	90	–	GND	130	–	GND
11	O	SDSY	51	I	DCV7	91	O	CO1	131	I	TST25
12	O	SASY	52	I	DCV8	92	O	CO0	132	I	TST26
13	I	ASYNC	53	I	DCV9	93	I	COEN	133	I	TST27
14	I	DCSY	54	I	IER9	94	I	TST17	134	I	TST28
15	I	TST11	55	I	IER8	95	I	TEST4	135	I	OSEL0
16	O	PPWM	56	I	IER7	96	I	TEST3	136	I	OSEL1
17	O	PLL2	57	I	IER6	97	I	TEST2	137	I	OSEL2
18	O	FSC	58	I	IER5	98	I	TEST1	138	I	MDDATA
19	O	CK2FSC	59	–	GND	99	I	TEST0	139	–	GND
20	–	V_{DD}	60	–	V_{DD}	100	–	V_{DD}	140	–	V_{DD}
21	O	CK4FSC	61	I	IER4	101	I	TMOD	141	I	DD SCK
22	I	TST14	62	I	IER3	102	I	OUTCNT	142	I	DDSTART
23	I	DRSY	63	I	IER2	103	I	OEN	143	I	ICADD3
24	I	DSSY	64	I	IER1	104	O	YCO9	144	I	TCADD2
25	I	DCF0	65	I	IER0	105	O	YCO8	145	I	TCADD1
26	I	DCF1	66	I	TST15	106	O	YCO7	146	I	TCADD0
27	I	DCF2	67	I	TST16	107	O	YCO6	147	O	STDATA
28	I	APARI	68	O	ADCK	108	O	YCO5	148	O	SFTP
29	I	ACV0	69	O	ERPWM	109	O	YCO4	149	O	XSITE
30	–	GND	70	–	GND	110	–	GND	150	–	GND
31	I	ACV1	71	O	ERW	111	O	YCO3	151	I	CK
32	I	ACV2	72	O	OER2	112	O	YCO2	152	I	OSEL3
33	I	ACV3	73	O	OER3	113	O	YCO1	153	O	GD7
34	I	ACV4	74	O	OER4	114	O	YCO0	154	O	GD6
35	I	ACV5	75	O	OER5	115	O	OHD	155	O	GD5
36	I	ACV6	76	O	OER6	116	O	OVD	156	O	GD4
37	I	ACV7	77	O	OER7	117	O	OCF	157	O	GD3
38	I	ACV8	78	O	OER8	118	O	OPARI	158	O	GD2
39	I	ACV9	79	O	OER9	119	O	OWCK	159	O	GD1
40	–	V_{DD}	80	–	V_{DD}	120	–	V_{DD}	160	–	V_{DD}

INPUT

ACV0 – ACV9	; ANALOG INPUT DATA (0 – 9)
AGH	; ANALOG GATED H
APARI	; PARITY OF ANALOG INPUT DATA
ASYNC	; ANALOG COMPOSITE SYNC
CK	; INPUT 8FSC CK
CL	; POWER ON RESET
COEN	; CHROMA OUTPUT ENABLE
DCF0 – DCF2	; D2 INPUT CF (0 – 2)
DCSY	; DELAYED COMPOSITE SYNC
DCV0 – DCV9	; DIGITAL INPUT DATA (0 – 9)
DDSCK	; CK FOR SERIAL MODE DATA
DDSTART	; START PULSE OF SERIAL COMMUNICATION
DPARI	; PARITY OF DIGITAL INPUT DATA
DRSY	; DIGITAL DELAYED SYNC ($\overline{8}$fsc × 8N)
DSSY	; DIGITAL DELAYED SYNC (8fsc × 8N)
ICADD0–ICADD3	; IC ADDRESS (0 – 3)
IER0 – IER9	; NON STANDARD PLL ERROR INPUT (0 – 9)
MDDATA	; SERIAL MODE DATA FROM CPU
OEN	; Y (Y/C) OUTPUT ENABLE
OSEL0 – OSEL3	; TEST (0 – 3)
OUTCNT	; OUTPUT CONTROL : Y/YC MULTIPLEX
TEST0 – TEST4	; TEST (0 – 4)
TMOD	; TEST
TST11	; TEST11
TST14 – TST28	; TEST (14 – 28)

OUTPUT

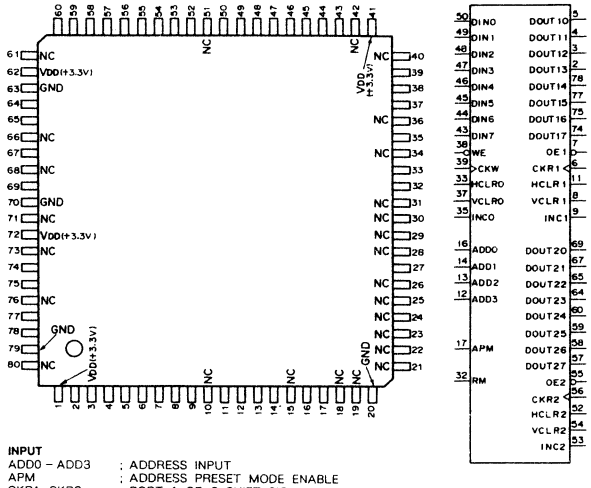
ADCK	; NON STANDARD PLL ERROR SAMPLING CK
ANA	; ANALOG/DIGITAL
CK2FSC	; INTERNAL 2FSC CK
CK4FSC	; INTERNAL 4FSC CK
CO0 – CO9	; CHROMA OUT (0 – 9)
CPWM	; CLAMP ERROR PWM
ERPWM	; NON STANDARD PLL ERROR SAMPLING PWM
ERW	; NON STANDARD PLL ERROR WIDTH
FSC	; INTERNAL FSC CK
GD0 – GD7	; GAIN DATA (0 – 7)
GH	; GATED H
MA	; MANUAL/AUTO (AGC MODE)
OCF	; CF INFORMATION
OER2 – OER9	; NON STANDARD PLL ERROR OUTPUT (2 – 9)
OHD	; HD
OPARI	; PARITY OF OUTPUT DATA
OVD	; VD
OWCK	; PSEUDO 13.5MHz/27MHz
PAL	; PAL/NTSC
PLL2	; DIGITAL PLL FOR 2FSC CK
PPWM	; SAMPLING CK PLL ERROR PWM
SASY	; ANALOG SYNC
SDSY	; DIGITAL SYNC
SFTP	; DIRECTION FOR SCH 0"
STDATA	; SERIAL OUTPUT DATA TO CPU
XSITE	; COMPONENT/COMPOSITE
YCO0 – YCO9	; Y (Y/C) OUTPUT (0 – 9)



CXK48324R (SONY)

C-MOS 2.4M (960x306x8) BITS 3 PORTS VIDEO FIELD MEMORY

– TOP VIEW –



INPUT

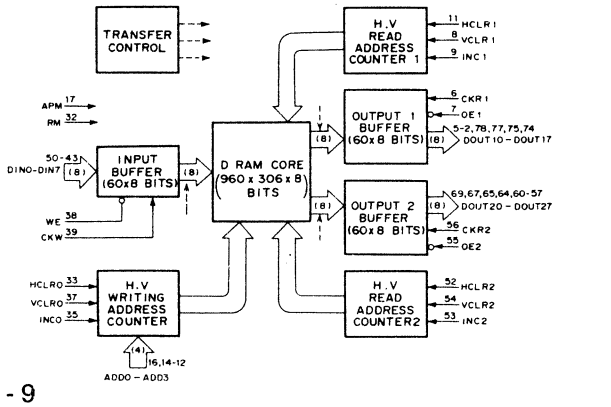
ADD0 – ADD3	; ADDRESS INPUT
APM	; ADDRESS PRESET MODE ENABLE
CKR1, CKR2	; PORT 1 OR 2 SHIFT SIGNAL INPUT
CKW	; PORT 0 SHIFT SIGNAL INPUT
DIN0 – DIN7	; PORT 0 DATA INPUT
HCLR0 – HCLR2	; PORT 0 – 2 HORIZONTAL CLEAR
INC0 – INC2	; PORT 0 – 2 LINE INCREMENT
RM	; RECURSIVE MODE ENABLE
TE	; TEST MODE ENABLE
VCLR0 – VCLR2	; PORT 0 – 2 VERTICAL CLEAR
OE1, OE2	; PORT 1 OR 2 OUTPUT ENABLE
WE	; PORT 0 WRITE ENABLE

OUTPUT

DO10 – DO17	; PORT 1 DATA OUTPUT
DO20 – DO27	; PORT 2 DATA OUTPUT

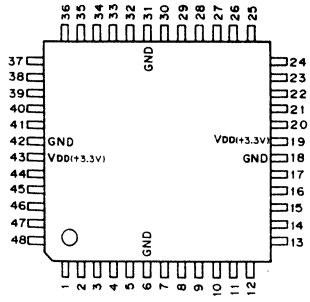
(V_{DD} = + 3.3 V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGANL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	–	V_{DD}	21	–	NC	41	–	V_{DD}	61	–	NC
2	O	DO13	22	–	NC	42	–	NC	62	–	V_{DD}
3	O	DO12	23	–	NC	43	I	DIN7	63	–	GND
4	O	DO11	24	–	NC	44	I	DIN6	64	O	DO23
5	O	DO10	25	–	NC	45	I	DIN5	65	O	DO22
6	I	CKR1	26	–	NC	46	I	DIN4	66	–	NC
7	I	/OE1	27	–	TE	47	I	DIN3	67	O	DO21
8	I	VCLR1	28	–	NC	48	I	DIN2	68	–	NC
9	I	INC1	29	–	NC	49	I	DIN1	69	O	DO20
10	–	NC	30	–	NC	50	I	DIN0	70	–	GND
11	I	HCLR1	31	–	NC	51	–	NC	71	–	NC
12	I	ADD3	32	I	RM	52	I	HCLR2	72	–	V_{DD}
13	I	ADD2	33	I	HCLR0	53	I	INC2	73	–	NC
14	I	ADD1	34	–	NC	54	I	VCLR2	74	O	DO17
15	–	NC	35	I	INC0	55	I	/OE2	75	O	DO16
16	I	ADD0	36	–	NC	56	I	CKR2	76	–	NC
17	I	APM	37	I	VCLR0	57	O	DO27	77	O	DO15
18	–	NC	38	I	/WE	58	O	DO26	78	O	DO14
19	–	NC	39	I	CKW	59	O	DO25	79	–	GND
20	–	GND	40	–	NC	60	O	DO24	80	–	NC



CXD8860Q (FUJITSU)

C-MOS 10-BIT PEDESTAL LEVEL REPLACEMENT OF COMPOSITE SIGNAL
– TOP VIEW –



(V_{DD} = + 3.3V)

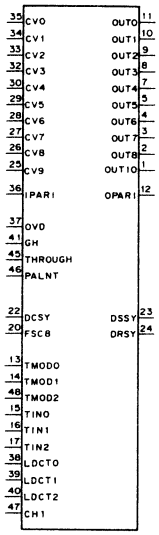
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	O	OUT9	13	I	TMOD0	25	I	CV9	37	I	OVD
2	O	OUT8	14	I	TMOD1	26	I	CV8	38	I	LDCT0
3	O	OUT7	15	I	TIN0	27	I	CV7	39	I	LDCT1
4	O	OUT6	16	I	TIN1	28	I	CV6	40	I	LDCT2
5	O	OUT5	17	I	TIN2	29	I	CV5	41	I	GH
6	–	GND	18	–	GND	30	I	CV4	42	–	GND
7	O	OUT4	19	–	V_{DD}	31	–	GND	43	–	V_{DD}
8	O	OUT3	20	I	FSC8	32	I	CV3	44	I	FSC4
9	O	OUT2	21	I	CLR	33	I	CV2	45	I	THROUGH
10	O	OUT1	22	I	DCSY	34	I	CV1	46	I	PALNT
11	O	OUT0	23	O	DSSY	35	I	CV0	47	I	CH1
12	O	OPARI	24	O	DRSY	36	I	IPARI	48	I	TMOD2

INPUT

CH1	; TEST PIN : OPEN
CLR	; POWER ON RESET
CV0 – CV9	; 10 – BIT COMPOSITE DATA
DCSY	; ANALOG SYNC
FSC4	; 4fsc CLOCK
FSC8	; 8fsc CLOCK
GH	; GH (GATED H) FROM CXD8819AQ
IPARI	; PARITY OF INPUT DATA
LDCT0 – LDCT2	; TEST PIN *1
OVD	; OUTPUT VD FROM CXD8819AQ
PALNT	; H : PAL, L : NTSC
THROUGH	; H (OPEN) : NORMAL, L : THROUGH
TIN0 – TIN2	; TEST PIN : OPEN
TMOD0 – TMOD2	; TEST PIN : OPEN

OUTPUT

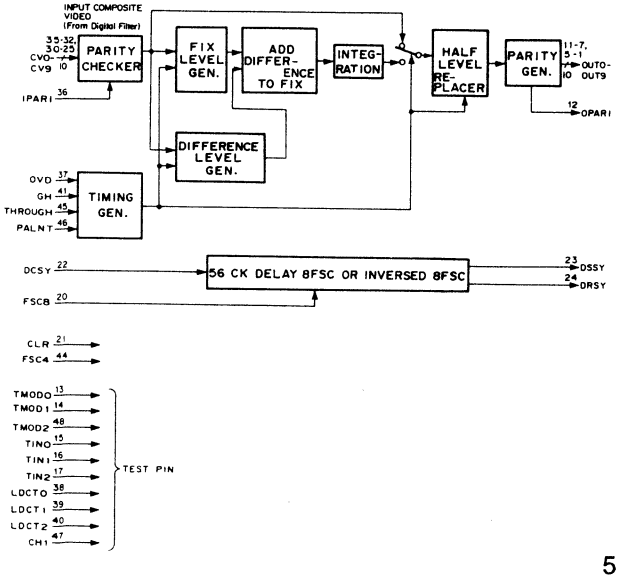
DRSY	; ANALOG DELAYED SYNC ($\overline{8fsc}$; 56-CLOCK)
DSSY	; ANALOG DELAYED SYNC (8fsc ; 56-CLOCK)
OPARI	; PARITY OF OUTPUT DATA
OUT0 – OUT9	; 10 – BIT COMPOSITE DATA



*1

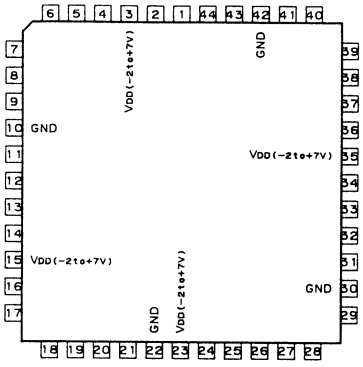
40PIN	39PIN	38PIN	PEDESTAL REPLACE POSITION
LDCT2	LDCT1	LDCT0	
0	1	1	– 3
0	1	0	– 2
0	0	1	– 1
0	0	0	NORMAL
1	1	1	+ 1
1	1	0	+ 2
1	0	1	+ 3
1	0	0	+ 4

0 ; LOW LEVEL (OPEN)
1 ; HIGH LEVEL (PULL UP)



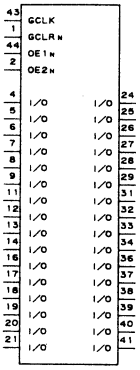
EPM7032LC44-3 (ALTERA)

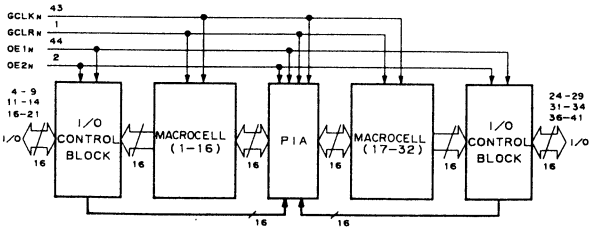
C-MOS ERASABLE PLD
– TOP VIEW –



(V_{DD} = – 2 to + 7 V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	$GCLR_N$	17	I/O	I/O	33	I/O	I/O
2	I	$OE2_N$	18	I/O	I/O	34	I/O	I/O
3	–	V_{DD}	19	I/O	I/O	35	–	V_{DD}
4	I/O	I/O	20	I/O	I/O	36	I/O	I/O
5	I/O	I/O	21	I/O	I/O	37	I/O	I/O
6	I/O	I/O	22	–	GND	38	I/O	I/O
7	I/O	I/O	23	–	V_{DD}	39	I/O	I/O
8	I/O	I/O	24	I/O	I/O	40	I/O	I/O
9	I/O	I/O	25	I/O	I/O	41	I/O	I/O
10	–	GND	26	I/O	I/O	42	–	GND
11	I/O	I/O	27	I/O	I/O	43	I	GCLK
12	I/O	I/O	28	I/O	I/O	44	I	$OE1_N$
13	I/O	I/O	29	I/O	I/O			
14	I/O	I/O	30	–	GND			
15	–	V_{DD}	31	I/O	I/O			
16	I/O	I/O	32	I/O	I/O			



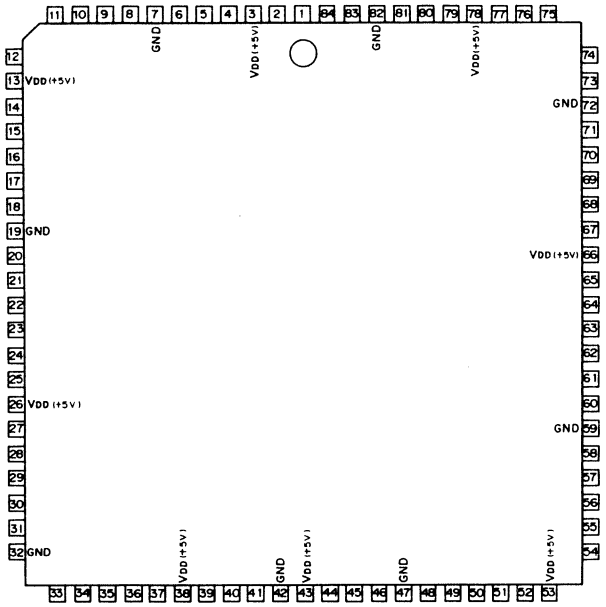


*ABOVE DIAGRAM SHOWS CONDITIONS BEFORE PROGRAMMING

EPM7128LC84-15 (ALTERA)

C-MOS FIELD PROGRAMMABLE LOGIC CIRCUIT EPLD

– TOP VIEW –

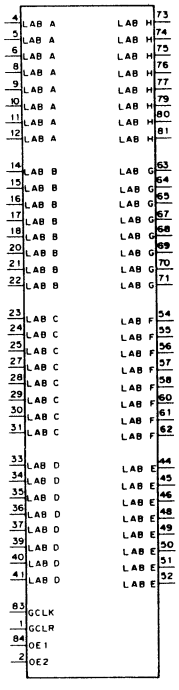


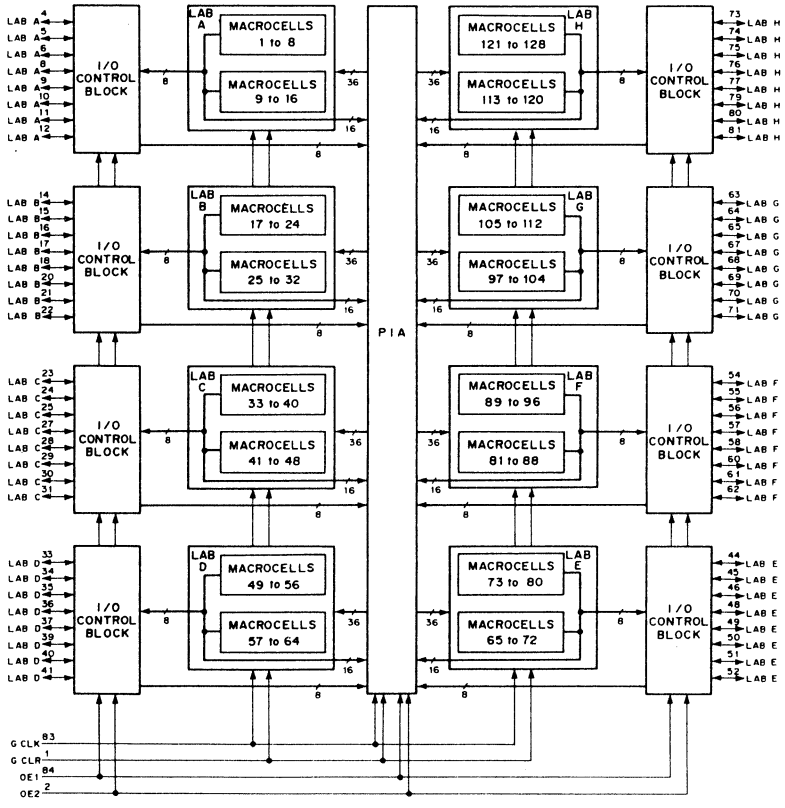
(VDD = + 5V)

PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	GCLR	22	I/O	LAB B	43	–	VDD	64	I/O	LAB G
2	I	OE2	23	I/O	LAB C	44	I/O	LAB E	65	I/O	LAB G
3	–	VDD	24	I/O	LAB C	45	I/O	LAB E	66	–	VDD
4	I/O	LAB A	25	I/O	LAB C	46	I/O	LAB E	67	I/O	LAB G
5	I/O	LAB A	26	–	VDD	47	–	GND	68	I/O	LAB G
6	I/O	LAB A	27	I/O	LAB C	48	I/O	LAB E	69	I/O	LAB G
7	–	GND	28	I/O	LAB C	49	I/O	LAB E	70	I/O	LAB G
8	I/O	LAB A	29	I/O	LAB C	50	I/O	LAB E	71	I/O	LAB G
9	I/O	LAB A	30	I/O	LAB C	51	I/O	LAB E	72	–	GND
10	I/O	LAB A	31	I/O	LAB C	52	I/O	LAB E	73	I/O	LAB H
11	I/O	LAB A	32	–	GND	53	–	VDD	74	I/O	LAB H
12	I/O	LAB A	33	I/O	LAB D	54	I/O	LAB F	75	I/O	LAB H
13	–	VDD	34	I/O	LAB D	55	I/O	LAB F	76	I/O	LAB H
14	I/O	LAB B	35	I/O	LAB D	56	I/O	LAB F	77	I/O	LAB H
15	I/O	LAB B	36	I/O	LAB D	57	I/O	LAB F	78	–	VDD
16	I/O	LAB B	37	I/O	LAB D	58	I/O	LAB F	79	I/O	LAB H
17	I/O	LAB B	38	–	VDD	59	–	GND	80	I/O	LAB H
18	I/O	LAB B	39	I/O	LAB D	60	I/O	LAB F	81	I/O	LAB H
19	–	GND	40	I/O	LAB D	61	I/O	LAB F	82	–	GND
20	I/O	LAB B	41	I/O	LAB D	62	I/O	LAB F	83	I	GCLK
21	I/O	LAB B	42	–	GND	63	I/O	LAB G	84	I	OE1

INPUT
GCLK : GROBAL CLOCK
GCLR : GROBAL CLEAR
OE1, 2 : OUTPUT ENABLE 1, 2

INPUT/OUTPUT
LAB A : LOGIC ARRAY BLOCK A
LAB B : LOGIC ARRAY BLOCK B
LAB C : LOGIC ARRAY BLOCK C
LAB D : LOGIC ARRAY BLOCK D
LAB E : LOGIC ARRAY BLOCK E
LAB F : LOGIC ARRAY BLOCK F
LAB G : LOGIC ARRAY BLOCK G
LAB H : LOGIC ARRAY BLOCK H

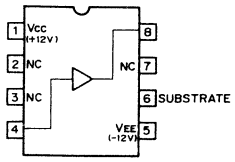




HA3-5033-5 (HARRIS)

VIDEO BUFFER

– TOP VIEW –

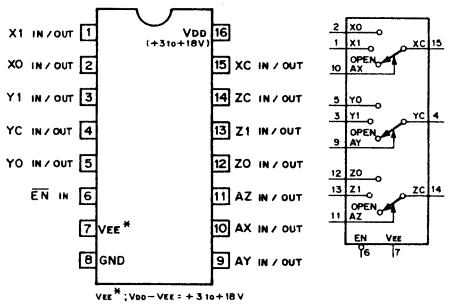


HD14053BFP (HITACHI) FLAT PACKAGE

MC14053BF (MOTOROLA) FLAT PACKAGE

C-MOS TRIPLE 2-CHANNEL ANALOG MULTIPLEXERS/DEMULTIPLEXERS

– TOP VIEW –



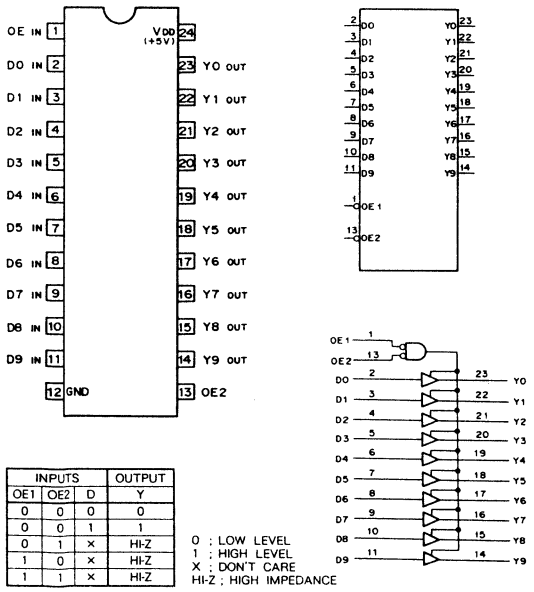
CONT. INPUTS		ON
EN	A (X, Y, Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

IDT74FCT827ATSO (IDT) FLAT PACKAGE

C-MOS 10-BIT NON-INVERTING BUFFER

– TOP VIEW –



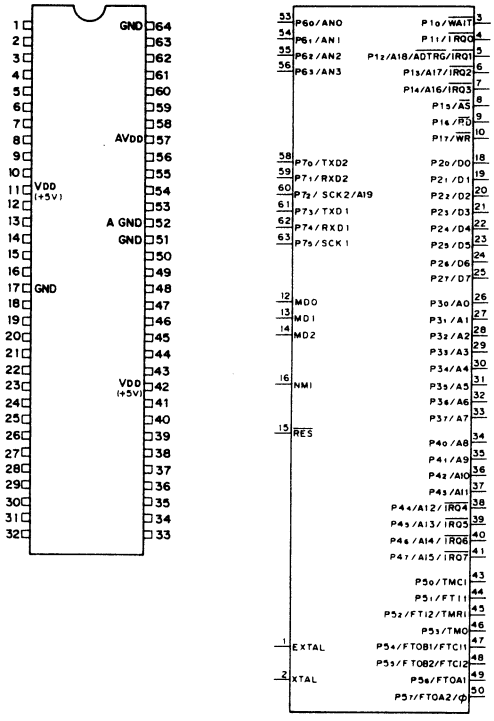
INPUTS			OUTPUT
OE1	OE2	D	Y
0	0	0	0
0	0	1	1
0	1	×	HI-Z
1	0	×	HI-Z
1	1	×	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

HD6475208P-10 (HITACHI)

C-MOS 16-BIT MICRO COMPUTER

– TOP VIEW –



(VDD = +5V)

PIN No.	I/O	PIN NAME	PIN No.	I/O	PIN NAME	PIN No.	I/O	PIN NAME	PIN No.	I/O	PIN NAME
1	I	EXTAL	17	–	VSS (GND)	33	I/O	P37/A7	49	I/O	P56/FTOA1
2	O	XTAL	18	I/O	P20/D0	34	I/O	P40/A8	50	I/O	P57/FTOA2/φ
3	I/O	P10/WAIT	19	I/O	P21/D1	35	I/O	P41/A9	51	–	VSS (GND)
4	I/O	P11/IRQ0	20	I/O	P22/D2	36	I/O	P42/A10	52	–	A GND
5	I/O	P12/AI8/ADTRG/IRQ1	21	I/O	P23/D3	37	I/O	P43/A11	53	I	P60/AN0
6	I/O	P13/AI7/IRQ2	22	I/O	P24/D4	38	I/O	P44/A12/IRQ4	54	I	P61/AN1
7	I/O	P14/AI6/IRQ3	23	I/O	P25/D5	39	I/O	P45/A13/IRQ5	55	I	P62/AN2
8	I/O	P15/AS	24	I/O	P26/D6	40	I/O	P46/A14/IRQ6	56	I	P63/AN3
9	I/O	P16/RD	25	I/O	P27/D7	41	I/O	P47/A15/IRQ7	57	–	AVCC
10	I/O	P17/WR	26	I/O	P30/A0	42	–	VDD	58	I/O	P70/TXD2
11	–	VCC	27	I/O	P31/A1	43	I/O	P50/TMCI	59	I/O	P71/RXD2
12	I	MD0	28	I/O	P32/A2	44	I/O	P51/FTI1	60	I/O	P72/SCK2/AI9
13	I	MD1	29	I/O	P33/A3	45	I/O	P52/FTI2/TMRI	61	I/O	P73/TXD1
14	I	MD2	30	I/O	P34/A4	46	I/O	P53/TMO	62	I/O	P74/RXD1
15	I/O	RES	31	I/O	P35/A5	47	I/O	P54/FTOB1/FTCI1	63	I/O	P75/SCK1
16	I	NMI	32	I/O	P36/A6	48	I/O	P55/FTOB2/FTCI2	64	–	VSS (GND)

AVDD/A GND : REFERENCE VOLTAGE FOR A/D CONVERTOR

INPUT

ADTRG	: EXTERNAL TRIGGER FOR A/D CONVERTOR
AN0 – AN3	: ANALOG INPUTS
EXTAL	: CONNECTED TO CRYSTAL OSCILLATOR
FTCI1, FTCI2	: * FRT COUNTER CLOCK (CHANNEL 1, 2)
FTI1, FTI2	: * FRT INPUT CAPTURE (CHANNEL 1, 2)
IRQ0 – IRQ7	: INTERRUPTION REQUEST 0 – 7
MD0 – MD2	: MODE SETTING
NMI	: NON MASKABLE INTERRUPTION
P60 – P63	: PORT 6
RXD1, RXD2	: RECEIVE DATA (CHANNEL 1, 2)
TMCI	: 8-BIT TIMER CLOCK
TMRI	: 8-BIT TIMER COUNTER RESET
WAIT	: WAIT

OUTPUT

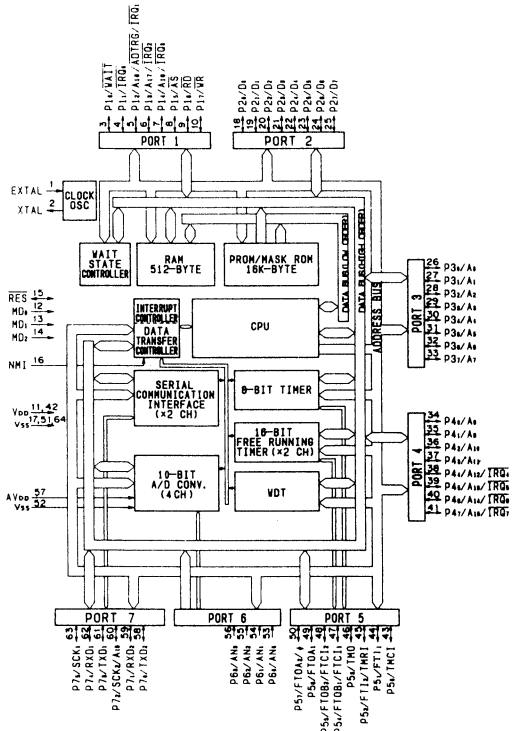
A0 – A19	: ADDRESS BUS
AS	: ADDRESS STROBE
FTOA1, FTOA2	: * FRT OUTPUT COMPARE A (CHANNEL 1, 2)
FTOB1, FTOB2	: * FRT OUTPUT COMPARE B (CHANNEL 1, 2)
RD	: READ
TMO	: 8-BIT TIMER
TXD1, TXD2	: TRANSMISSION DATA (CHANNEL 1, 2)
WR	: WRITE
XTAL	: CONNECTED TO CRYSTAL OSCILLATOR
φ	: SYSTEM CLOCK

INPUT/OUTPUT

D0 – D7	: DATA BUS
P10 – P17	: PORT 1
P20 – P27	: PORT 2
P30 – P37	: PORT 3
P40 – P47	: PORT 4
P50 – P57	: PORT 5
P70 – P75	: PORT 7
RES	: RESET
SCK1, SCK2	: SERIAL CLOCK (CHANNEL 1, 2)
* FRT	: FREE RUNNING TIMER

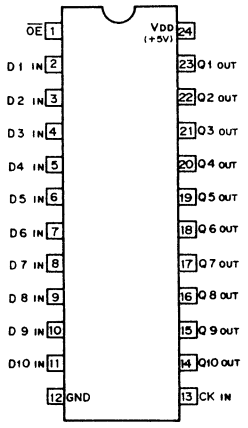
MD2	MD1	MD0	ACTUATION MODE	CONTENT
0	0	0	MODE 0	—
0	0	1	MODE 1	EXTENTION MINIMUM MODE (ROM REACTIVE)
0	1	0	MODE 2	EXTENTION MINIMUM MODE (ROM EFFECTIVE)
0	1	1	MODE 3	EXTENTION MINIMUM MODE (ROM REACTIVE)
1	0	0	MODE 4	EXTENTION MINIMUM MODE (ROM EFFECTIVE)
1	0	1	MODE 5	—
1	1	0	MODE 6	HARDWARE STANDBY MODE
1	1	1	MODE 7	SINGLE CHIP MODE

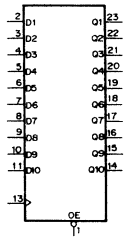
0 ; LOW LEVEL
1 ; HIGH LEVEL



IDT74FCT821ATSO (IDT) FLAT PACKAGE

C-MOS 10-BIT BUS INTERFACE FLIP-FLOPS WITH 3-STATE OUTPUTS
– TOP VIEW –



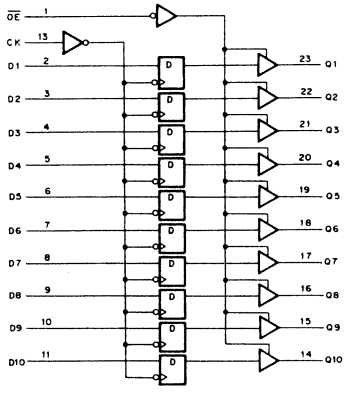


FUNCTION TABLE (EACH FLIP-FLOP)

INPUTS			OUTPUT
OE	CK	D	Q
0	↑	1	1
0	↑	0	0
0	0	×	Q_0
1	×	×	HI-Z

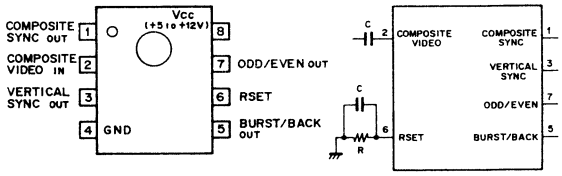
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

LOGIC DIAGRAM (POSITIVE LOGIC)

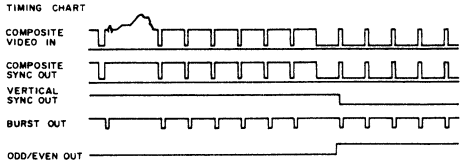


LM1881M (NS) FLAT PACKAGE

VIDEO SYNC SEPARATOR
– TOP VIEW –

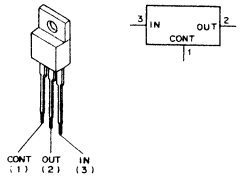


TIMING CHART



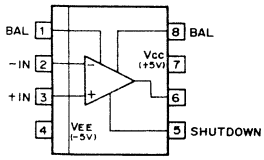
LM317LZ (NSC)
LM317T (NSC)

3-TERMINAL ADJUSTABLE REGULATOR



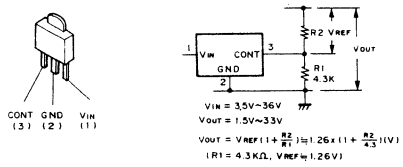
LT1191CS8 (LINEAR TECH) FLAT PACKAGE

HIGH SPEED OPERATIONAL AMPLIFIER
– TOP VIEW –



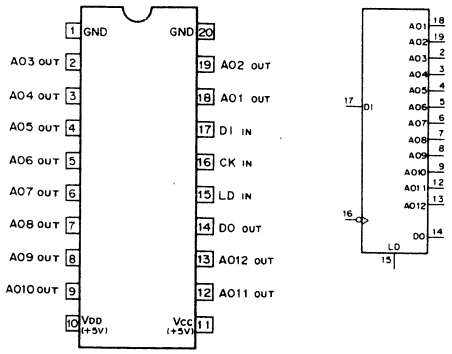
M5237ML (MITSUBISHI)

ADJUSTABLE VOLTAGE REGULATOR

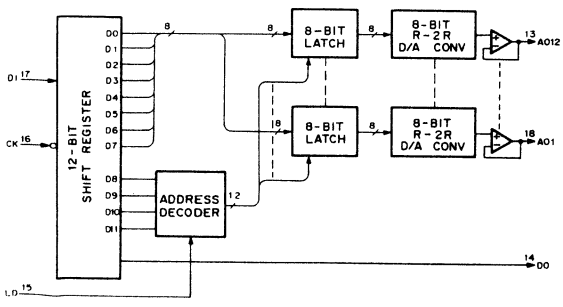


MB88346BPFV (FUJITSU) FLAT PACKAGE (SMALL)

C-MOS 8-BIT D/A CONVERTER
– TOP VIEW –

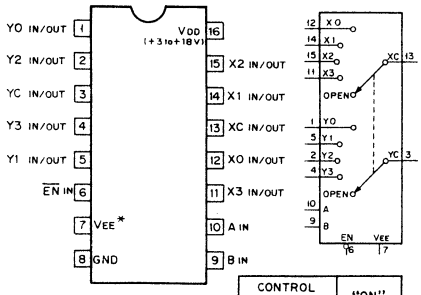


AO1 – AO12 : 8-BIT D/A OUTPUTS
CK : CLOCK INPUT
DI : SERIAL DATA INPUT
DO : DATA OUTPUT
LD : DATA LOAD CONTROL INPUT (H : LOAD)



MC14052BF (MOTOROLA) FLAT PACKAGE

C-MOS DUAL 4-CHANNEL ANALOG MULTIPLEXERS/DEMULTIPLEXERS
– TOP VIEW –



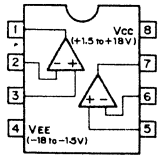
VEE*; VDD – VEE = +3 to +18V

CONTROL INPUTS			"ON" CHANNEL
EN	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

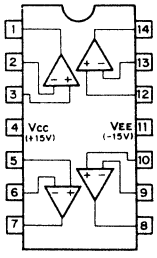
MC34182M (MOTOROLA) FLAT PACKAGE
TL082CPS (TI) FLAT PACKAGE
TL082M (TI)

OPERATIONAL AMPLIFIER
(J FET INPUT)
– TOP VIEW –



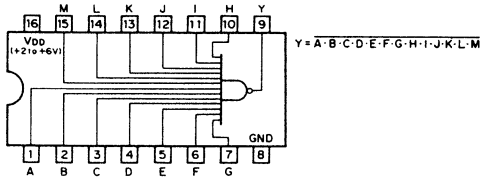
MC34184M (MOTOROLA) FLAT PACKAGE

JFET INPUT OPERATIONAL AMPLIFIER
– TOP VIEW –

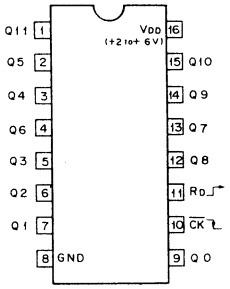


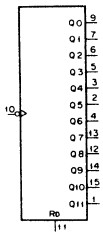
MC74HC133F (MOTOROLA) FLAT PACKAGE
TC74HC133AF (TOSHIBA) FLAT PACKAGE

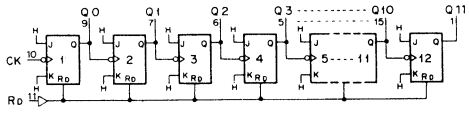
C-MOS 13-INPUT NAND GATE
– TOP VIEW –



MC74HC4040F (MOTOROLA) FLAT PACKAGE
SN74HC4040ANS (TI) FLAT PACKAGE
C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DRIVER
– TOP VIEW –





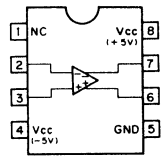


COUNT	Q11	Q10	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	0	0	0	0	1	1
4095	1	1	1	1	1	1	1	1	1	1	1	1

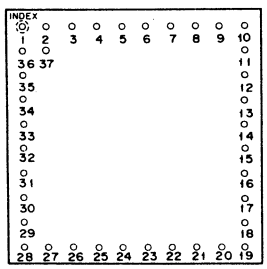
RD	Q11……Q0
1	ALL LOW
0	COUNT

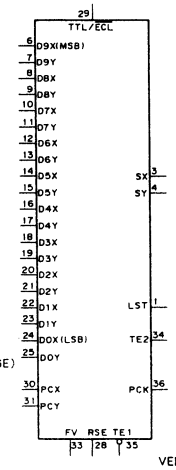
0; LOW LEVEL
1; HIGH LEVEL

NJM360M (JRC) FLAT PACKAGE
HIGH SPEED VOLTAGE COMPARATOR
(TTL OUTPUT)
– TOP VIEW –



SBX1601A (SONY)
8- OR 10-BIT PARALLEL-TO-SERIAL CONVERTER
– BOTTOM VIEW –





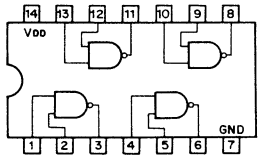
INPUT
D9X – D0X, D9Y – D0Y : PARALLEL DATA INPUTS
PCX, PCY : PARALLEL CLOCK INPUTS
FV : VCO FREQ. ADJ. INPUT
RSE : VCO RANGE SELECT INPUT (H : HIGH RANGE)
TE1 : TEST TERMINAL (LOW = TEST)
TTL/ECL : VCC FOR INPUT LEVEL SELECT (+ 5V = TTL, GND = ECL)

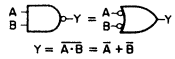
OUTPUT
LST : PLL LOCK DETECT OUTPUT (H : LOCK)
PCK : PARALLEL CLOCK OUTPUT
SX, SY : SERIAL DATA OUTPUTS
TE2 : TEST TERMINAL

VEE1 = – 5V
VEE2 = – 3.5V

PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	O	LST	11	I	D7Y	21	I	D2Y	31	I	PCY
2	–	GND	12	I	D6X	22	I	D1X	32	–	GND
3	O	SX	13	I	D6Y	23	I	D1Y	33	I	FV
4	O	SY	14	I	D5X	24	I	D0X(LSB)	34	O	TE2
5	–	GND	15	I	D5Y	25	I	D0Y	35	I	TE1
6	I	D9X(MSB)	16	I	D4X	26	–	VEE1	36	O	PCK
7	I	D9Y	17	I	D4Y	27	–	VEE2	37	–	NC
8	I	D8X	18	I	D3X	28	I	RSE			
9	I	D8Y	19	I	D3Y	29	–	TTL/ECL			
10	I	D7X	20	I	D2X	30	I	PCX			

SN74HC00ANS (TI) FLAT PACKAGE
C-MOS QUAD 2-INPUT NAND GATES
– TOP VIEW –





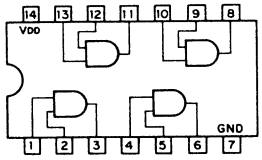
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

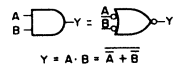
0; LOW LEVEL
1; HIGH LEVEL

NOTE :

TYPE	VDD
TC74AC00 TYPE TC74VHC00	+2 to +5.5V
MC74HCT00N	+5V
74ACT00 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

SN74HC08ANS (TI) FLAT PACKAGE
C-MOS QUAD 2-INPUT AND GATES
– TOP VIEW –





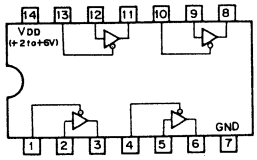
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

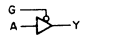
0; LOW LEVEL
1; HIGH LEVEL

NOTE :

TYPE	VDD
TC74AC08F MC74ACT08M	+ 2 to + 5.5V
TC40H	+ 2 to + 8V
OTHER TYPES	+ 2 to + 6V

SN74HC125ANS (TI) FLAT PACKAGE
C-MOS BUS BUFFER GATES WITH 3-STATE OUTPUT
– TOP VIEW –

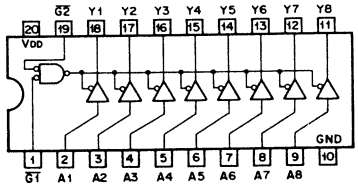




G	A	Y
0	0	0
0	1	1
1	X	HI – Z

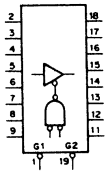
O; LOW LEVEL X; DON'T CARE
1; HIGH LEVEL HI-Z; HIGH IMPEDANCE

SN74HC541ANS (TI) FLAT PACKAGE
C-MOS BUFFERS AND LINE DRIVERS WITH 3-STATE OUTPUTS
– TOP VIEW –



G1	G2	A	Y
0	0	0	0
0	0	1	1
1	X	X	HI-Z
X	1	X	HI-Z

O; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE
HI-Z; HIGH IMPEDANCE

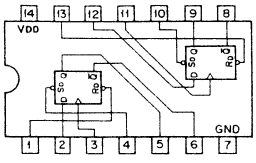


NOTE :

TYPE	VDD
AC/VHC	+2 to +5.5V
HC	+2 to +6V
ACT/BCT/HCT	+5V

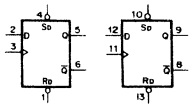
SN74HC74ANS (TI) FLAT PACKAGE

C-MOS DUAL D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET
– TOP VIEW –



INPUTS				OUTPUTS	
$\overline{S_D}$	$\overline{R_D}$	CK	D	Qn+1	$\overline{Q_{n+1}}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1	1
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	0	X	Qn	$\overline{Q_n}$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

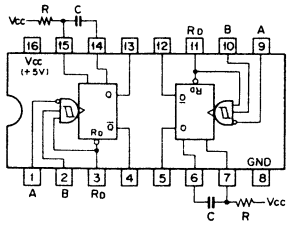


NOTE :

TYPE	VDD
TC74HCT74AF	+5V
TC74AC74 TYPE	+2 to +5.5V
74ACT74 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

SN74LS221NS (TI) FLAT PACKAGE

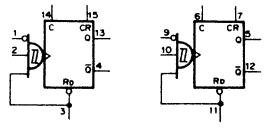
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
– TOP VIEW –



INPUTS			OUTPUTS	
$\overline{R_D}$	A	B	Q	$\overline{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⊓	⊔
1	↓	1	⊓	⊔
↑	0	1	⊓	⊔

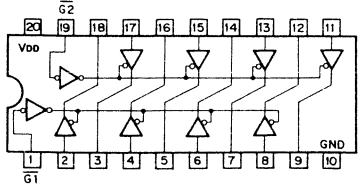
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

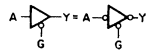
OUTPUT PULSE WIDTH = 0.7CR



SN74HCT244ANS (TI) FLAT PACKAGE

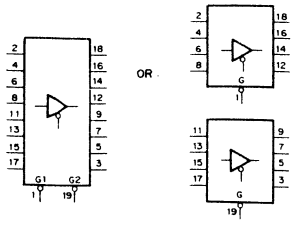
C-MOS BUS BUFFER WITH 3-STATE OUTPUTS
– TOP VIEW –





G	A	Y
0	0	0
0	1	1
X	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

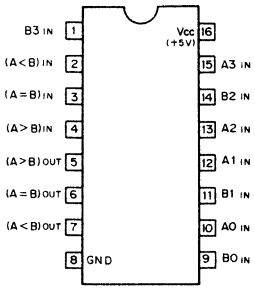


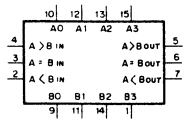
NOTE :

TYPE	VDD
AC HC 40H	+2 to +6V
ACT FCT HCT	+5V
VHC	+2 to +5.5V

SN74LS85NS (TI) FLAT PACKAGE

TTL 4-BIT MAGNITUDE COMPARATOR
– TOP VIEW –



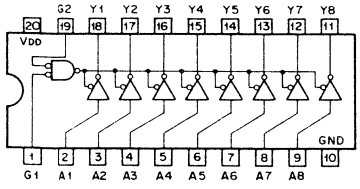


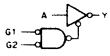
INPUTS									OUTPUTS		
DATA COMPARING					CASCADING						
	A3 , B3	A2 , B2	A1 , B1	A0 , B0	A<B	A=B	A>B	A<B	A=B	A>B
A>B	A3 > B3	X	X	X	X	X	X	0	0	1
	A3 = B3	A2 > B2	X	X						
	A3 = B3	A2 = B2	A1 > B1	X						
	A3 = B3	A2 = B2	A1 = B1	A0 > B0						
A=B	A3 = B3	A2 = B2	A1 = B1	A0 = B0	0	0	0	1	0	1
					0	0	1	0	0	1
					X	1	X	0	1	0
					1	0	0	1	0	0
					1	0	1	0	0	0
A<B	A3 = B3	A2 = B2	A1 = B1	A0 < B0	X	X	X	1	0	0
	A3 = B3	A2 = B2	A1 < B1	X						
	A3 = B3	A2 < B2	X	X						
	A3 < B3	X	X	X						

0 ; LOW LEVEL 1 ; HIGH LEVEL X ; DON'T CARE

SN74HCT540ANS (TI) FLAT PACKAGE

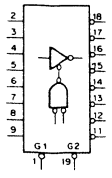
C-MOS 3-STATE INVERTING BUFFER/LINE DRIVER/LINE RECEIVER
– TOP VIEW –





G1	G2	A	Y
0	0	0	1
0	0	1	0
1	X	X	HI-Z
X	1	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

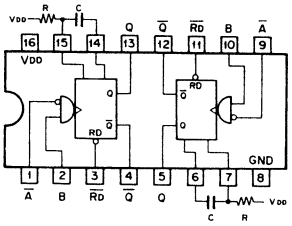


NOTE :

TYPE	VDD
ACT/HCT	+5V
TC74AC540 TYPE TC74VHC540	+2 to +5.5V
OTHER TYPES	+2 to +6V

TC74HC123AF (TOSHIBA) FLAT PACKAGE

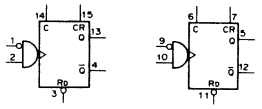
C-MOS DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATORS
– TOP VIEW –



INPUT			OUTPUT	
RD	A	B	Q	Q̄
0	X	X	0	1
1	1	X	0	1
1	X	0	0	1
1	0	↓	⊓	⊓
1	↑	1	⊓	⊓
↓	0	1	⊓	⊓

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

OUTPUT PULSE WIDTH = 0.46CR

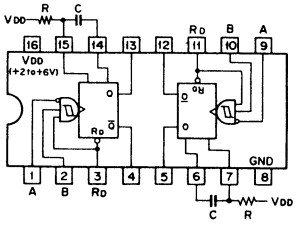


NOTE :

TYPE	VDD
TC74HCT123AF	+5V
OTHER TYPES	+2 to +6V

TC74HC221AF (TOSHIBA) FLAT PACKAGE

C-MOS MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
– TOP VIEW –



INPUTS			OUTPUTS	
RD	A	B	Q	Q̄
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⊓	⊓
1	↓	1	⊓	⊓
↑	0	1	⊓	⊓

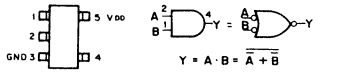
0;LOW LEVEL
1;HIGH LEVEL
X;DON'T CARE

OUTPUT PULSE WIDTH = 0.7CR

TC7S08F (TOSHIBA) CHIP PACKAGE

C-MOS 2-INPUT AND GATE

(SCALE 6/1)
TOP VIEW



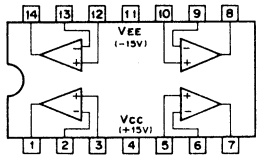
A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0; LOW LEVEL
1; HIGH LEVEL

TYPE	VDD
7S08F 7S08FU	+ 2 to + 6V
4S81F 14S81F	+ 3 to + 18V

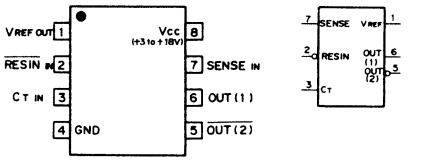
TL084CNS (TI) FLAT PACKAGE

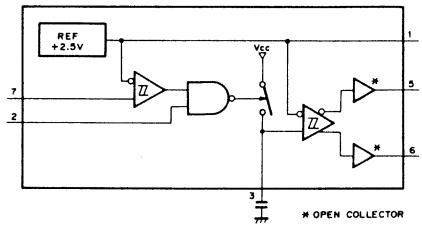
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –



TL7705CPS-B (TI) FLAT PACKAGE

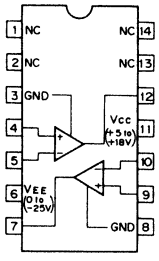
POWER VOLTAGE SUPERVISOR
– TOP VIEW –





UPC319G2 (NEC) FLAT PACKAGE

DUAL VOLTAGE COMPARATOR
– TOP VIEW –



SECTION 6
BOARD LAYOUTS AND SCHEMATIC DIAGRAMS

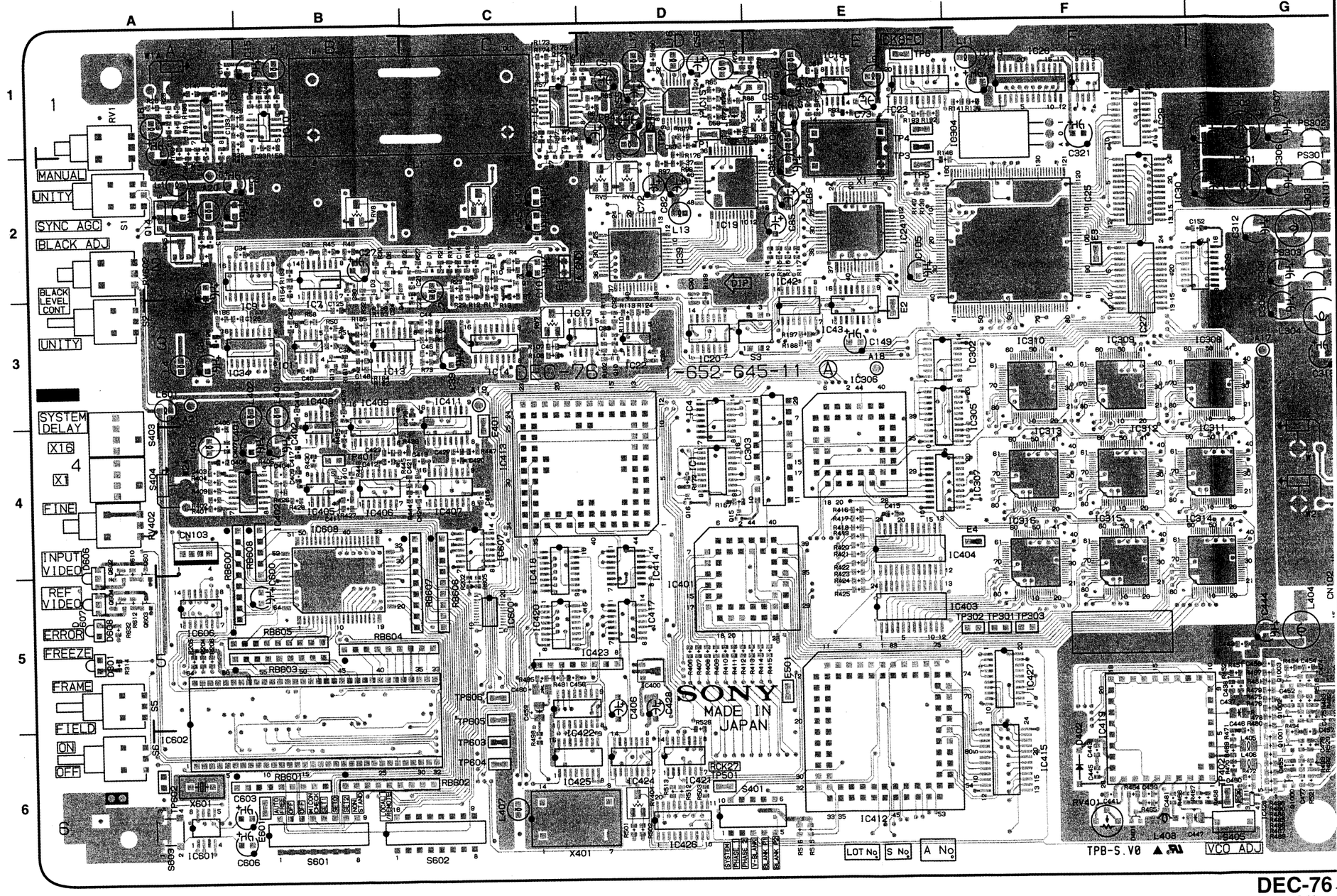
Board Name	Function
DEC-76	DECODER BOARD
CN-476	CONNECTOR PANEL

DEC-76 ; DECODER BOARD

DEC-76 (1-652-645-11)

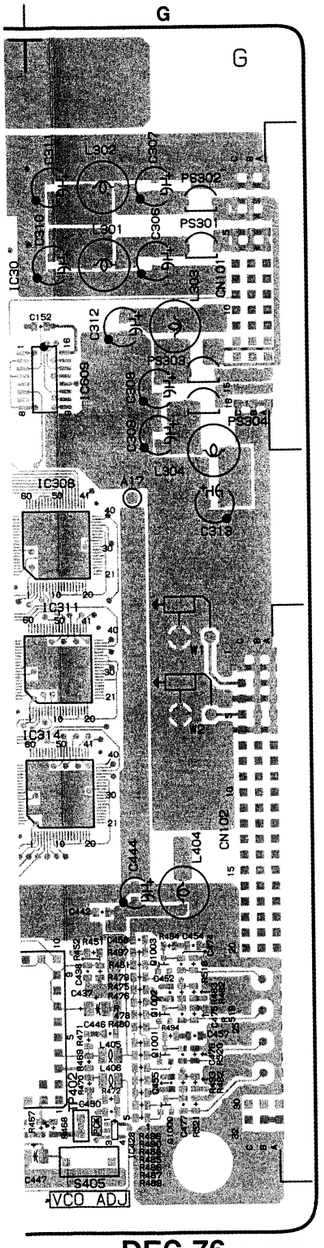
CNI306	E-3	IC42	E-2	Q13	B-3
CNI401	D-5	IC43	E-2	Q14	A-2
CNI412	E-6	IC45	A-2	Q15	D-4
CNI602	A-6	IC302	F-3	Q16	D-4
CN101	G-2	IC303	E-4	Q401	D-5 (B)
CN102	G-5	IC304	F-1	Q402	D-5 (B)
CN103	A-4	IC305	F-4	Q601	A-5
		IC306	E-3	Q602	A-5
D1	C-2	IC307	F-4	Q603	A-5
D2	D-2	IC308	G-3	Q604	A-5
D3	B-3	IC309	F-3	Q1000	G-6
D4	E-2 (B)	IC310	F-3	Q1001	G-6
D5	E-1 (B)	IC311	G-4	Q1002	G-6
D6	B-2	IC312	G-4	Q1003	G-5
D7	B-2 (B)	IC313	F-4		
D8	C-2 (B)	IC314	G-4	RB600	B-4
D9	B-2 (B)	IC315	F-4	RB601	B-6
D10	E-1 (B)	IC316	F-4	RB602	C-6
D11	E-1 (B)	IC400	D-5	RB603	B-5
D301	A-5	IC401	D-5	RB604	B-5
D401	F-6	IC402	B-4	RB605	B-5
D402	F-6	IC403	F-5	RB606	C-5
D606	A-4	IC404	F-4	RB607	C-5
D607	A-5	IC405	B-4	RB608	B-4
D608	A-5	IC406	B-4		
D609	B-6 (B)	IC407	C-4	RV1	A-1
		IC408	B-3	RV2	C-2
E1	C-2	IC409	B-3	RV3	E-1
E2	E-3	IC411	C-4	RV4	D-2
E3	F-2	IC412	E-6	RV5	D-2
E4	F-4	IC413	C-4	RV7	C-3
E401	C-4	IC414	D-5	RV8	B-2
E501	E-5	IC415	F-6	RV401	F-6
E601	B-6	IC417	D-5	RV402	A-4
		IC418	C-5	RV404	D-6
FL1	C-2	IC419	F-6	RV602	A-2
		IC420	C-5		
IC1	D-4	IC421	D-6	S1	A-2
IC2	B-2 (B)	IC422	C-6	S2	A-3
IC3	D-4 (B)	IC423	D-5	S3	E-3
IC4	D-3	IC424	D-6	S5	A-5
IC5	B-2 (B)	IC425	C-6	S6	A-6
IC6	A-1	IC426	D-6	S401	D-6
IC7	B-3	IC427	F-5	S403	A-4
IC8	C-2 (B)	IC428	G-6	S404	A-4
IC9	B-3	IC600	C-5	S405	G-6
IC10	B-1	IC601	A-6	S601	B-6
IC11	B-3	IC602	A-6	S602	C-6
IC12	C-1	IC603	B-5 (B)	S603	A-6
IC13	B-3	IC605	B-5 (B)		
IC14	C-3	IC606	A-5	TP1	D-1
IC15	D-1	IC607	C-4	TP2	D-1
IC16	E-1	IC608	B-4	TP3	E-2
IC17	D-3	IC609	G-2	TP4	E-2
IC18	E-1	IC626	B-6 (B)	TP5	E-2
IC19	D-2			TP6	E-1
IC20	D-3	PS301	G-1	TP301	F-5
IC21	D-3 (B)	PS302	G-2	TP302	F-5
IC22	D-3	PS303	G-2	TP303	F-5
IC23	E-1	PS304	G-3	TP401	B-4
IC24	E-2			TP402	G-6
IC25	F-2	Q1	C-2	TP501	D-6
IC26	F-1	Q2	C-2	TP602	A-6
IC27	F-3	Q3	C-2	TP603	C-6
IC28	F-1	Q4	B-3	TP604	C-6
IC29	F-1	Q5	C-2 (B)	TP605	C-6
IC30	F-2	Q6	C-2 (B)	TP606	C-5
IC31	E-3 (B)	Q7	C-2 (B)		
IC34	B-3	Q8	D-2 (B)	X1	E-2
IC36	C-2 (B)	Q9	D-3 (B)	X401	C-6
IC39	D-2	Q10	D-3	X601	A-6
IC40	E-3 (B)	Q11	E-2 (B)		
IC41	D-3 (B)	Q12	C-1 (B)		

NOTE
※-※ ; ※-※A SIDE
※-※(B); ※-※B SIDE

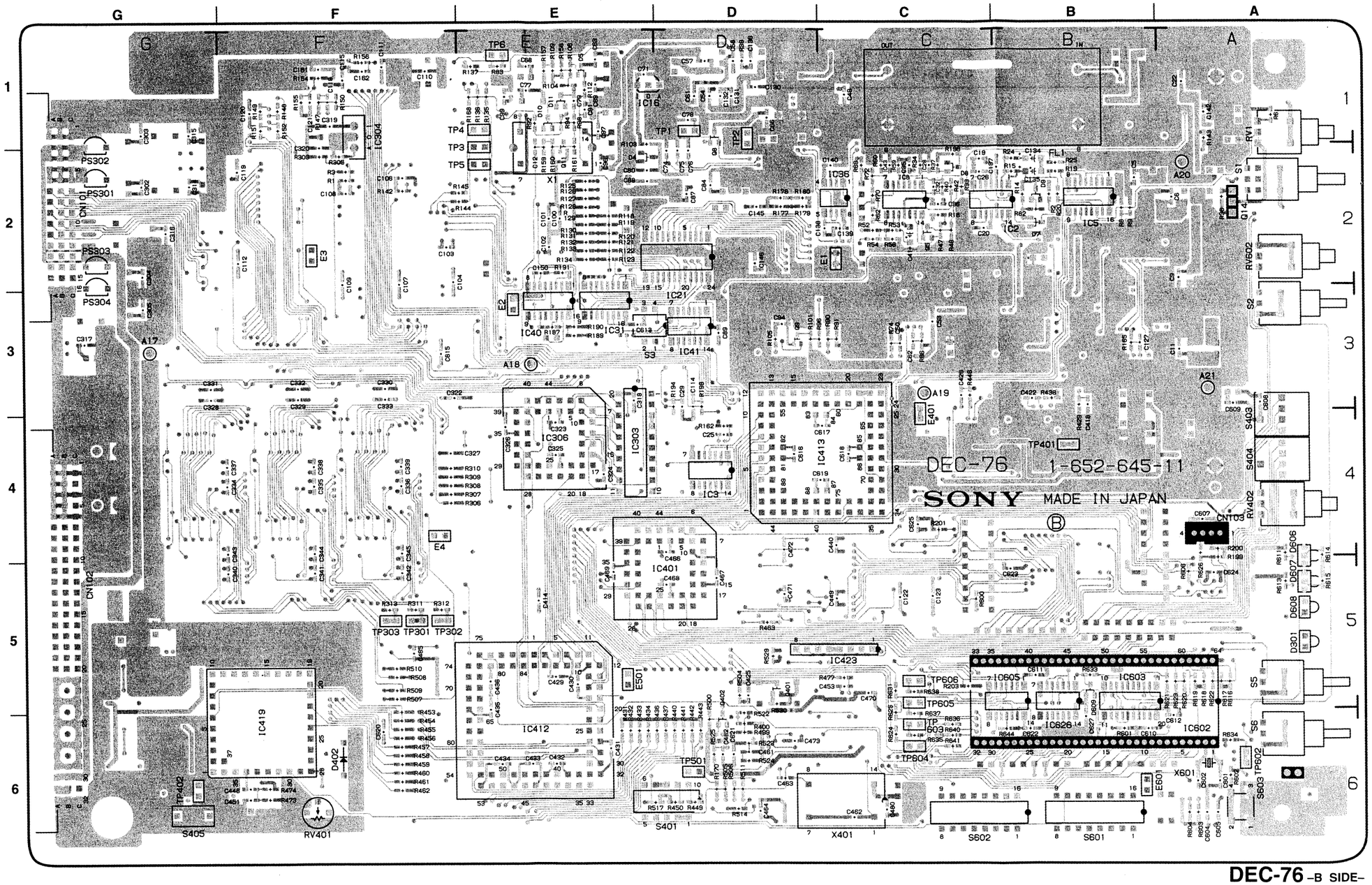


DEC-76
1-652-645-11
BKPF-131P

6 - 2

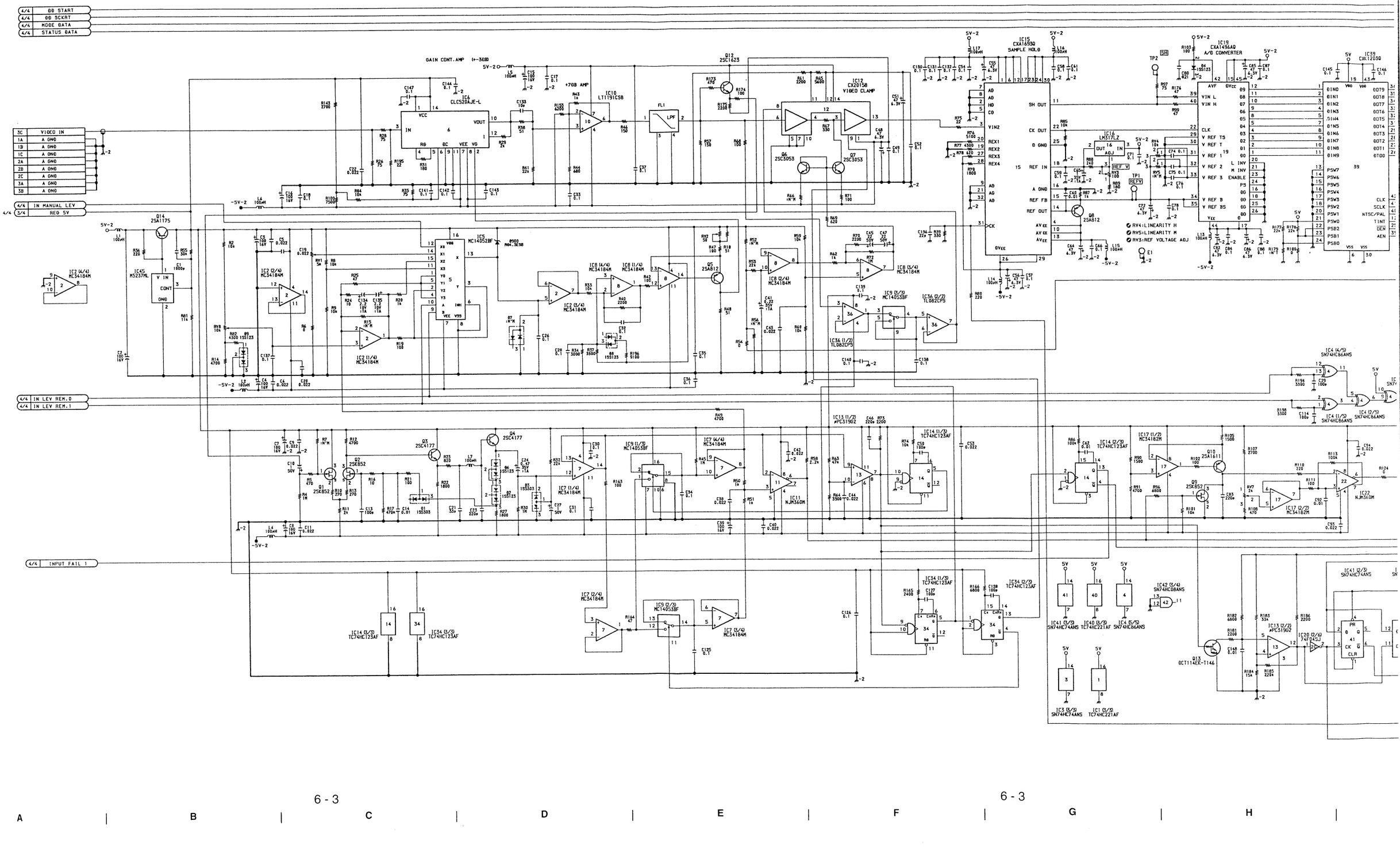


DEC-76 –A SIDE–
1-652-645-11
BKPF-131P

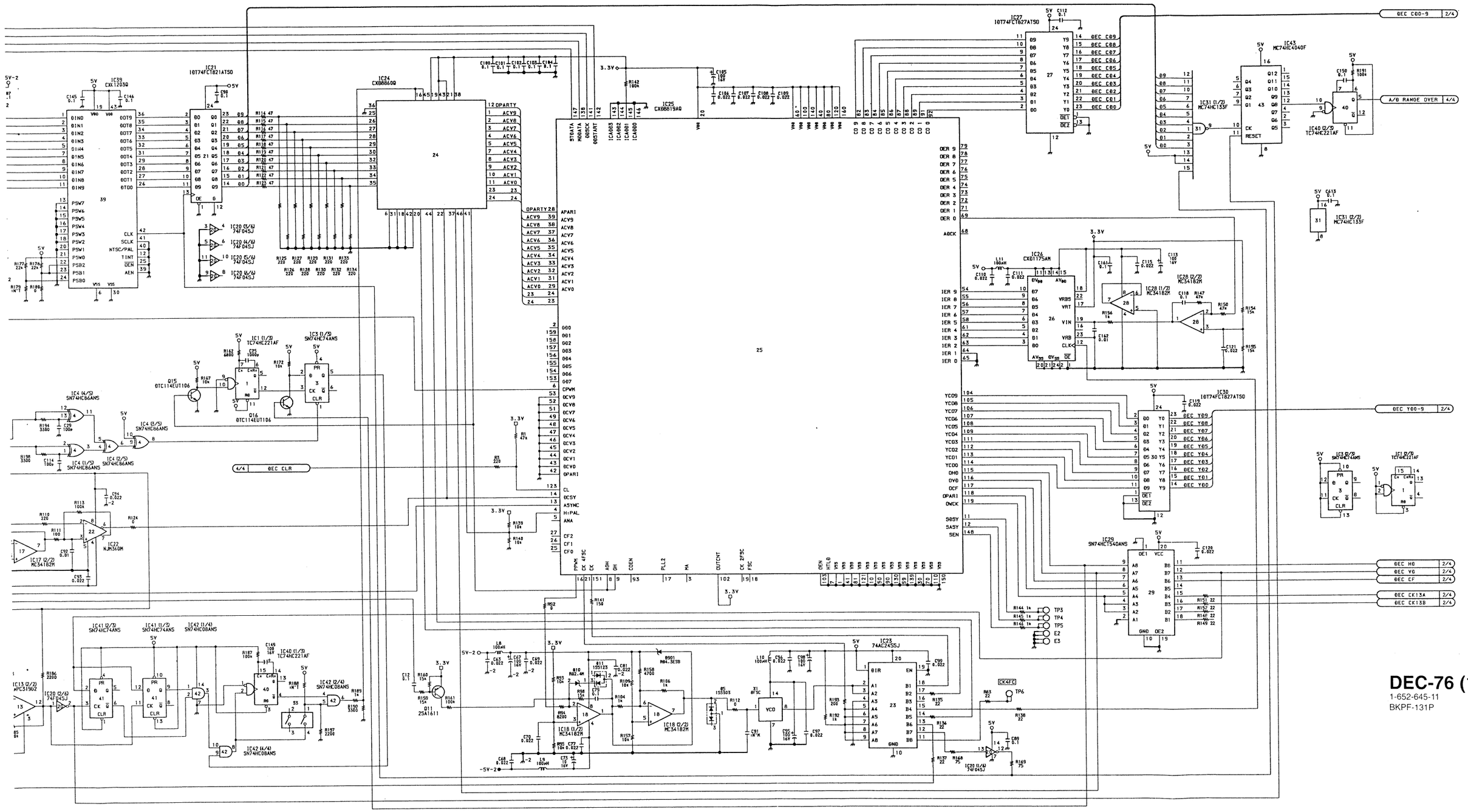


DEC-76 –B SIDE–
1-652-645-11
BKPF-131P

DEC-76 (1/4) ; DECODER BOARD

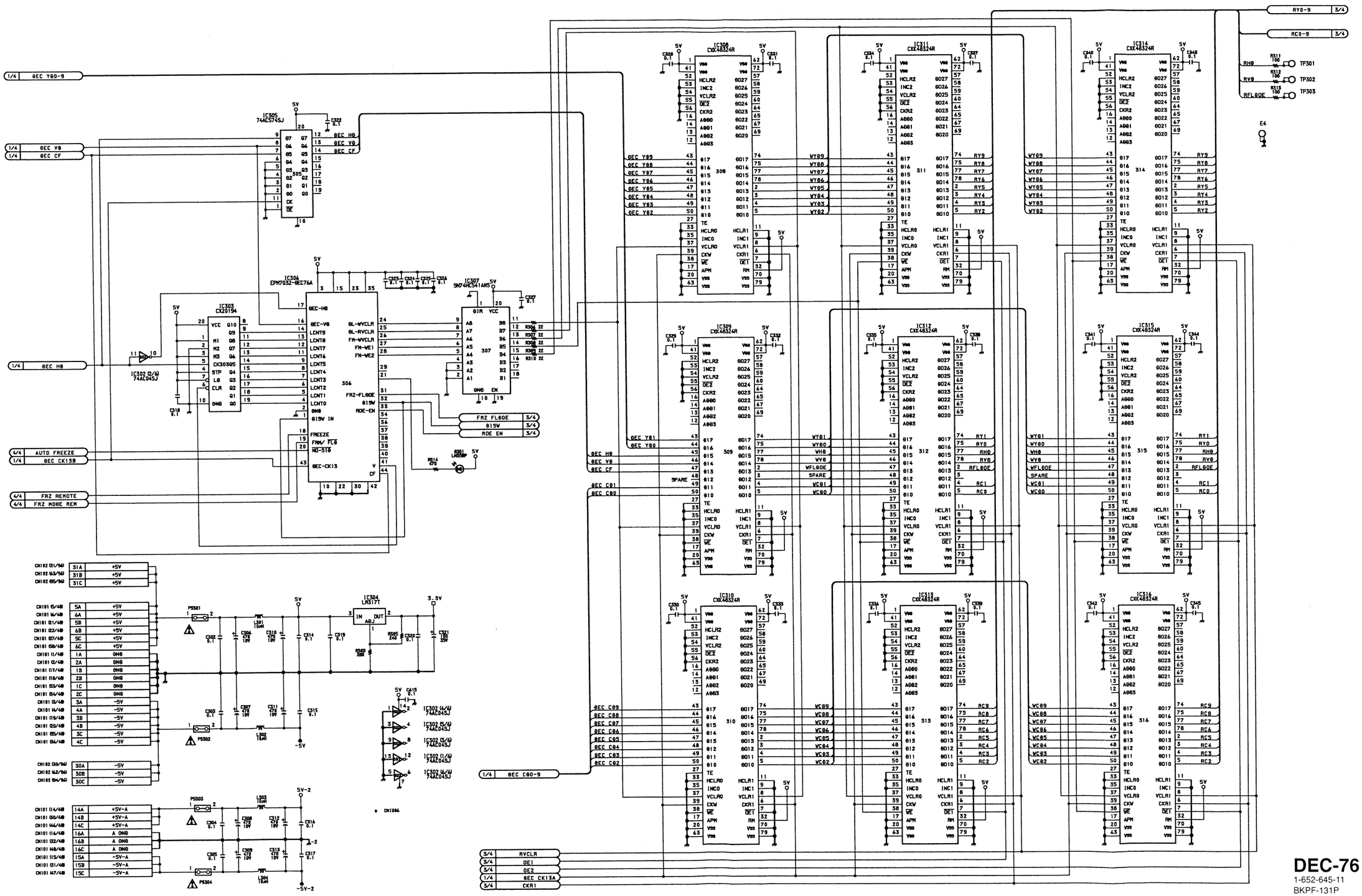


A | B | C | D | E | F | G | H |



DEC-76 (1/4)
1-652-645-11
BKPF-131P

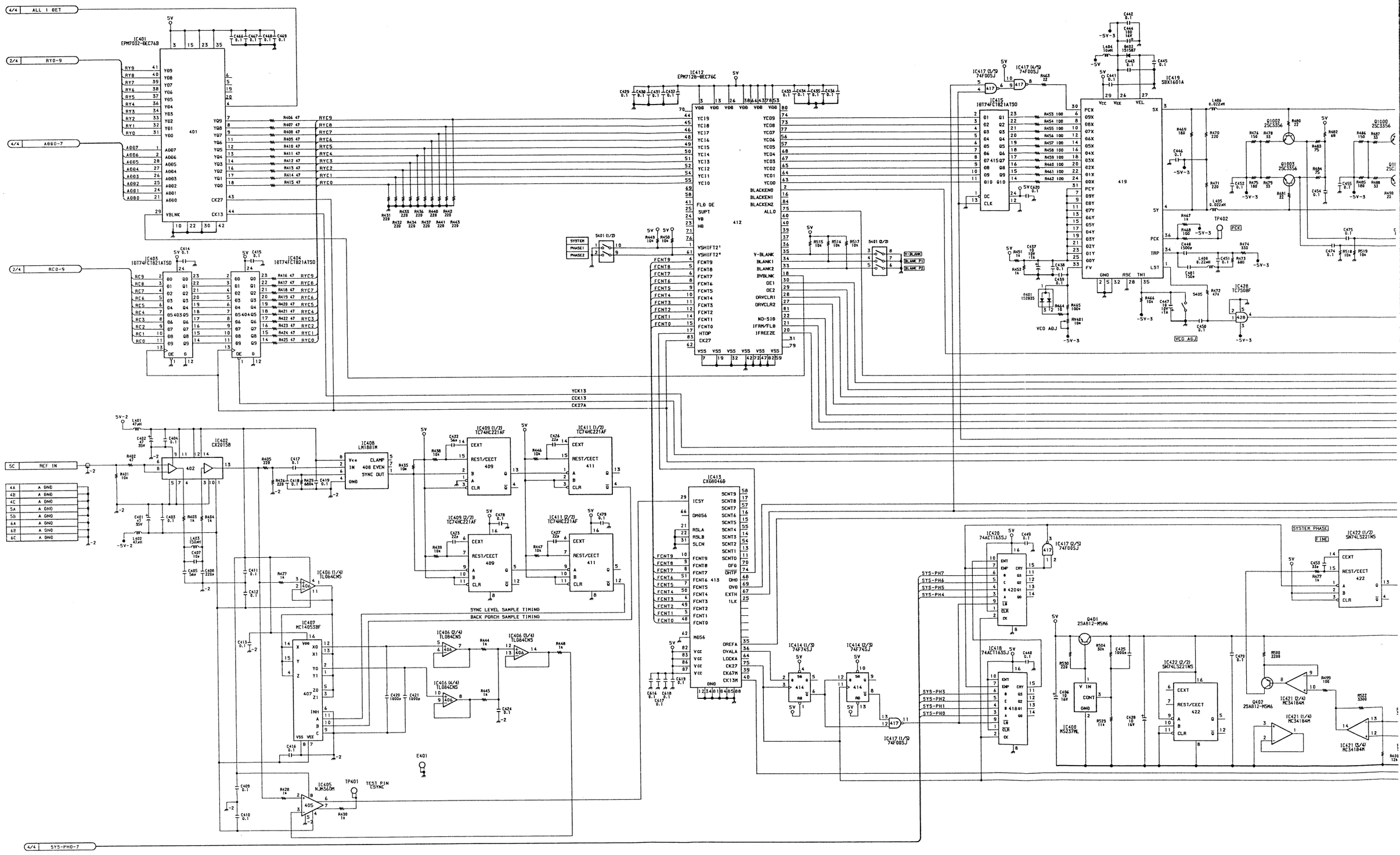
DEC-76 (2/4) ; DECODER BOARD



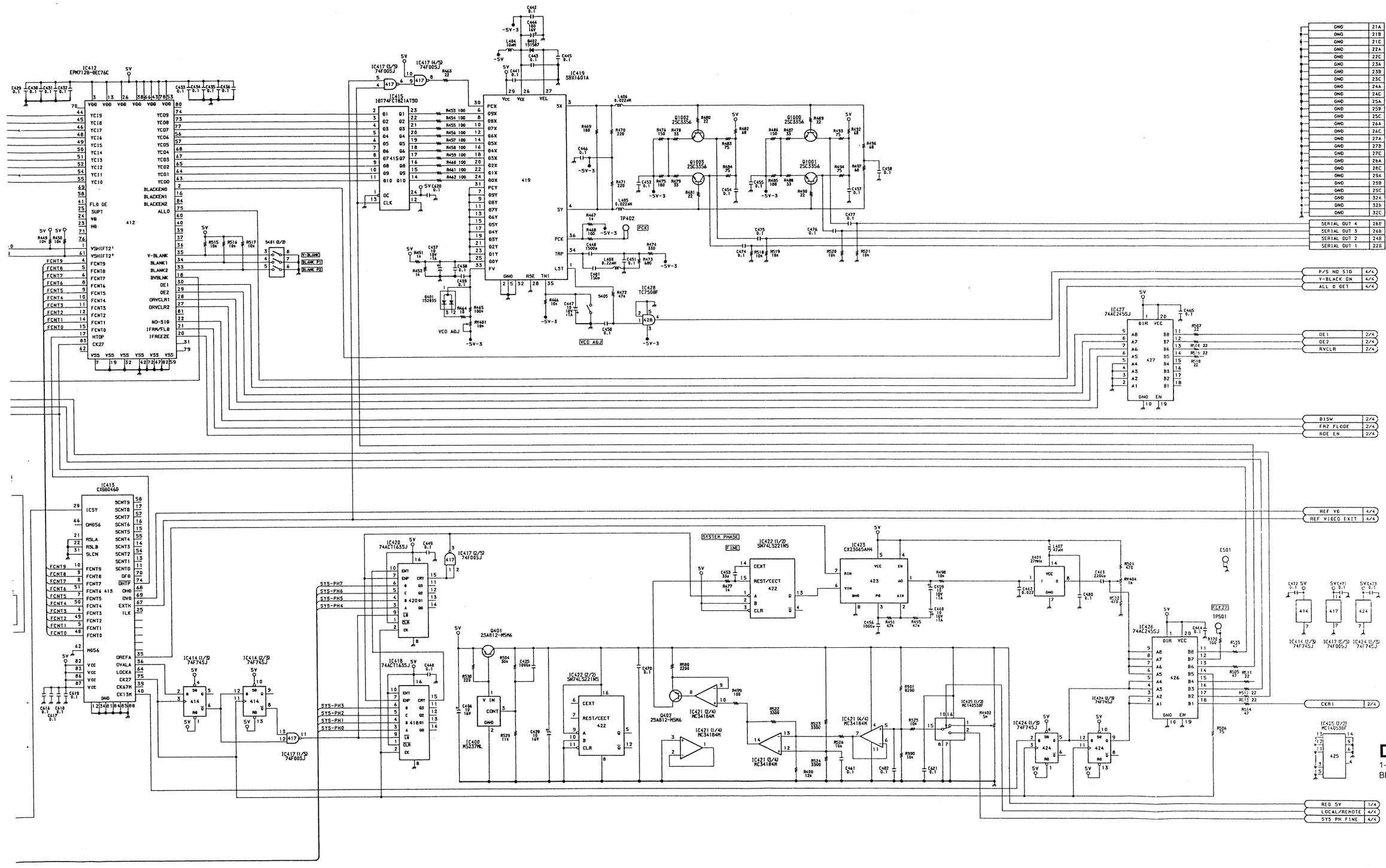
6 - 5

DEC-76 (2/4)
1-652-645-11
BKPF-131P

DEC-76 (3/4) ; DECODER BOARD



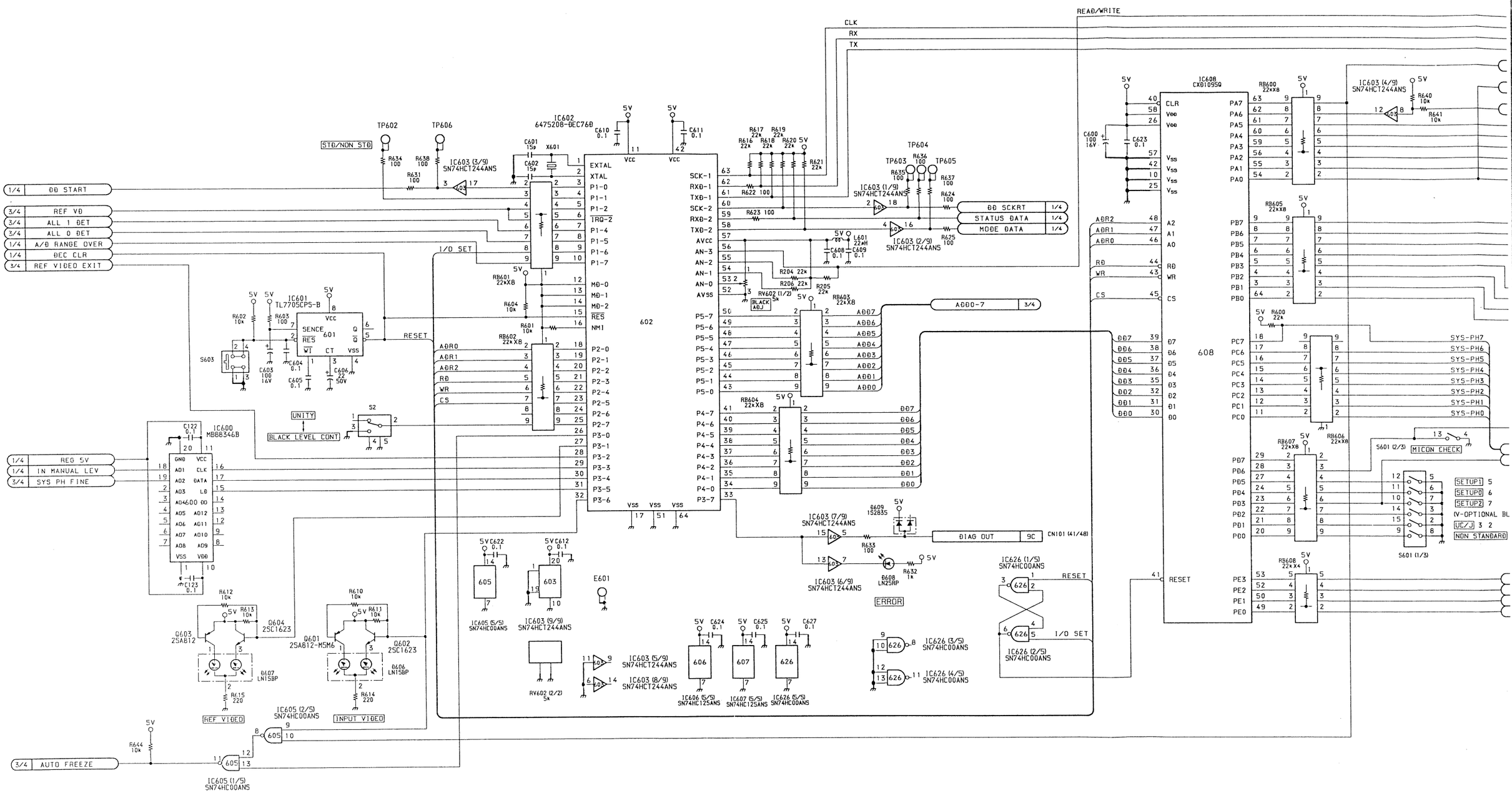
DEC-76 (3/4)



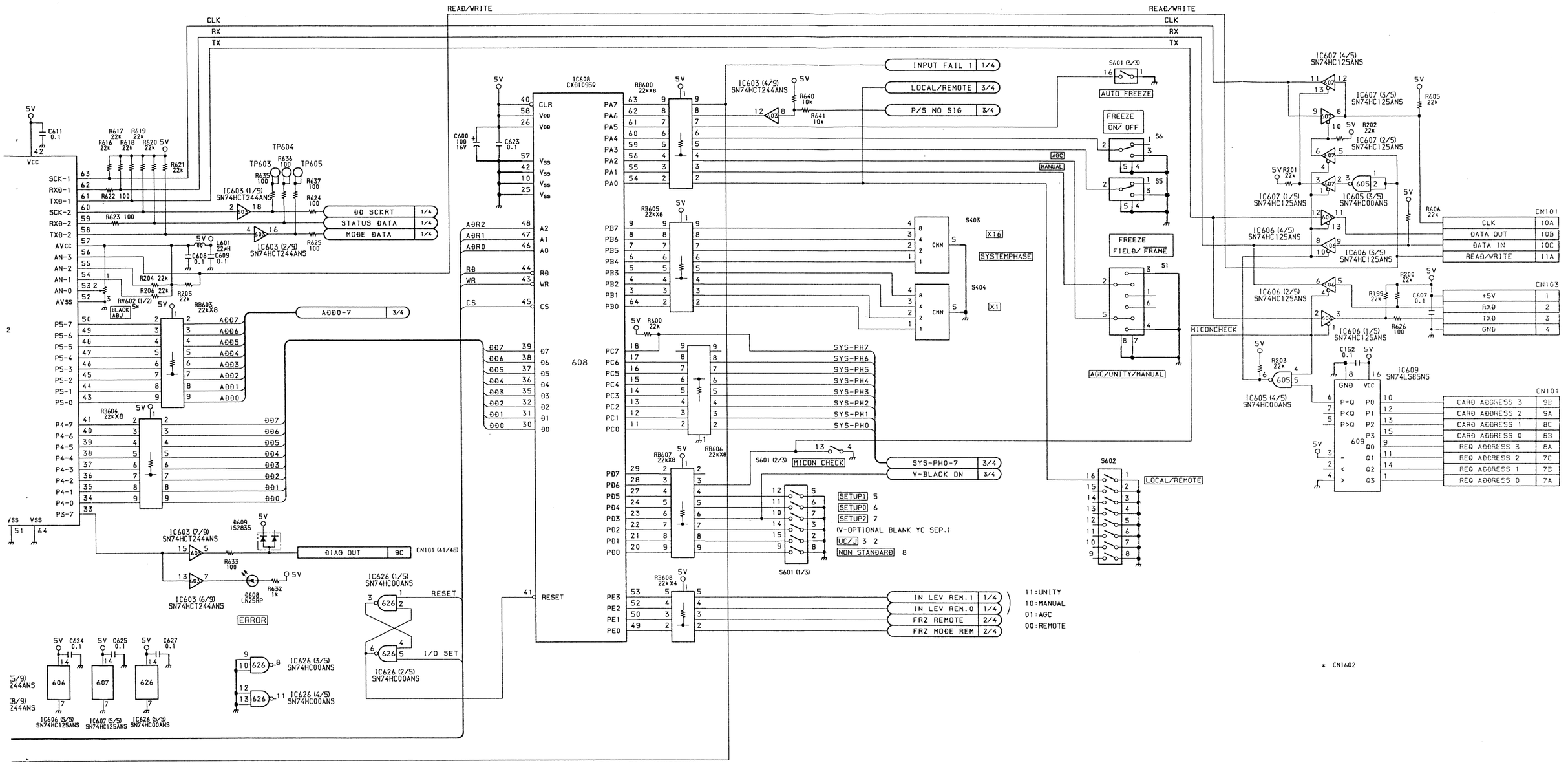
6 - 7

DEC-76 (3/4)
1-652-645-11
BKPF-131P

DEC-76 (4/4) ; DECODER BOARD



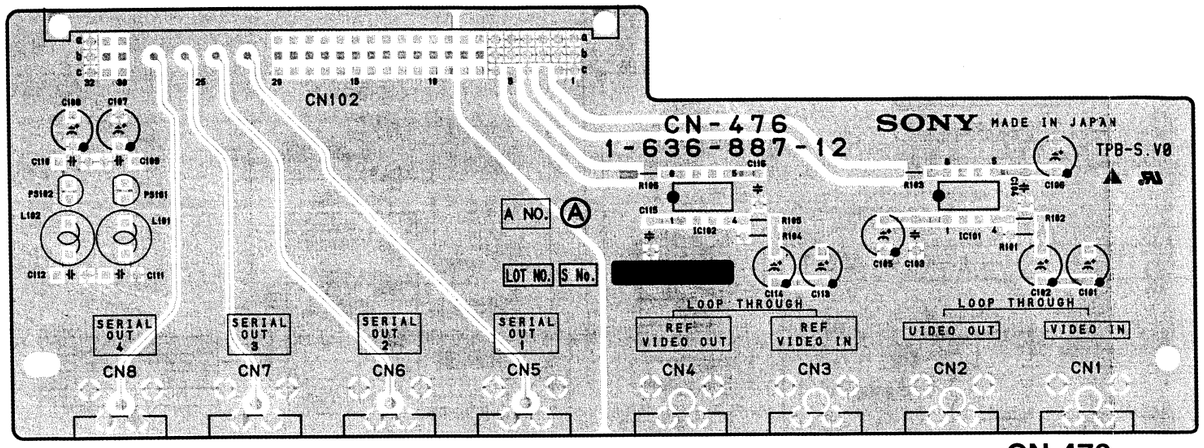
DEC-76 (4/4)



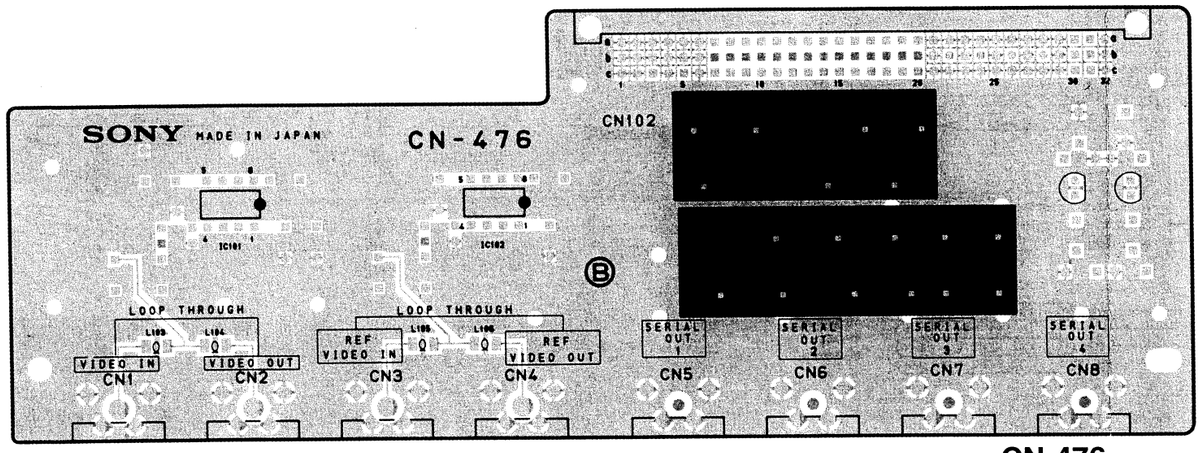
DEC-76 (4/4)
1-652-645-11
BKPF-131P

CN-476 CN-476

CN-476 ; CONNECTOR PANEL



CN-476 –A SIDE–
1-636-887-12
BKPF-131P

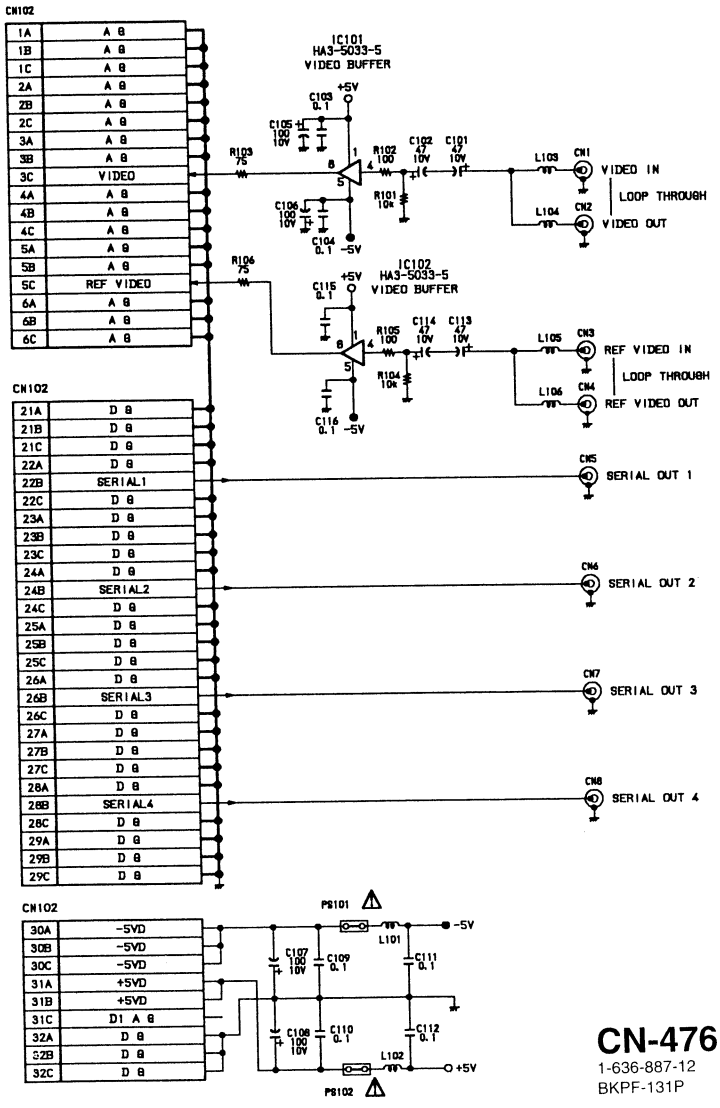


CN-476 –B SIDE–
1-636-887-12
BKPF-131P

6 - 10

6 - 10

CN-476 ; CONNECTOR PANEL



CN-476
1-636-887-12
BKPF-131P

SECTION 7
SPARE PARTS

7-1. PARTS INFORMATION

(1) The ⚠-marked components are critical to safety.
Replace only with same components as spacified.

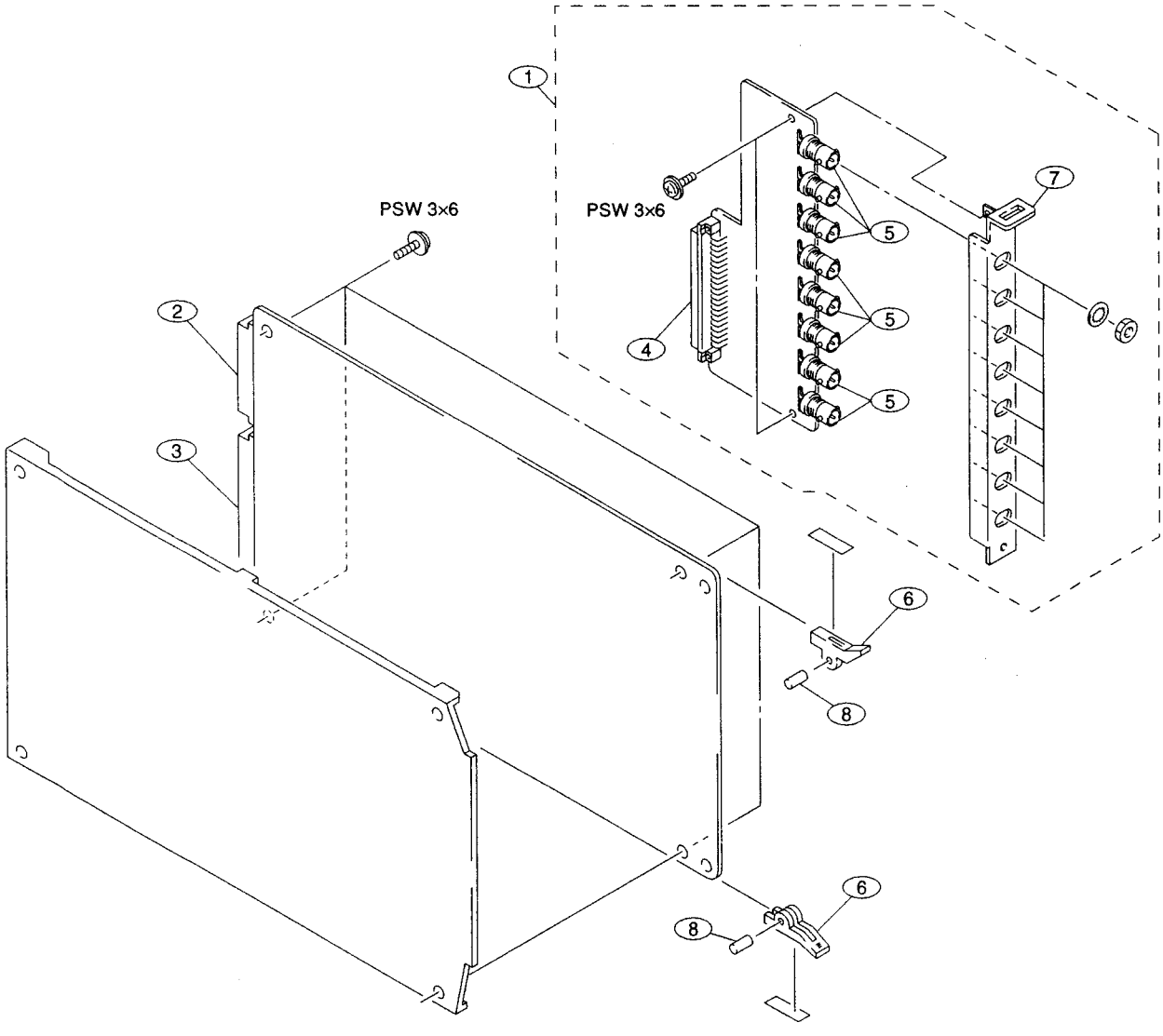
(2) Spare Parts supplied from the Sony Parts Center will sometimes have a different shape from the original parts.
This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".
This manual's spare parts list indicate the part numbers of "the standardized genuine parts at the present".
Regarding engineering part changes in our engineering department, refer to Sony service bulletins and service manual supplements.

(3) The parts marked with "s" in the SP column of the spare parts list are normally stocked for replacement purposes.
The parts marked with "o" in the SP column are not normally required for routine service work.
Orders for parts marked with "o" will be processed, but allow for additional delivery time.

(4) Item with no parts number and/or no description are not stocked because they are seldom required for routine service.

(5) All resistors are in ohms.

7-2. EXPLODED VIEW



No.	Part No.	SP	Description
1	A-8275-679-A	o	MOUNTED CIRCUIT BOARD, CN-476D
2	1-506-746-11	s	CONNECTOR (DIP), DIN 48P, MALE
3	1-506-748-11	o	CONNECTOR (DIP), DIN 96P, MALE
4	1-563-341-11	s	CONNECTOR (DIP), DIN 96P, FEMALE
5	1-764-273-11	s	CONNECTOR, COAXIAL (BNC TYPE)
6	2-182-909-01	o	LEVER, PC BOARD
7	3-184-047-01	o	PANEL, CONNECTOR
8	7-626-320-11	s	PIN, SPRING 3 × 8

7-3. ELECTRICAL PARTS LIST

CN-476D BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8275-679-A	o	MOUNTED CIRCUIT BOARD, CN-476D
1pc	3-184-047-11	o	CONNECTOR, PANEL
2pcs	7-682-947-01	s	SCREW +PSW 3X6
2pcs	7-685-547-14	s	SCREW +BTP 3X10 TYPE2 N-S
C101	1-131-381-00	s	TANTALUM 47uF 10% 10V
C102	1-131-381-00	s	TANTALUM 47uF 10% 10V
C103	1-161-485-00	s	CERAMIC 0.1uF 50V
C104	1-161-485-00	s	CERAMIC 0.1uF 50V
C105-108	1-126-933-11	s	ELECT 100uF 20% 16V
C109-112	1-161-485-00	s	CERAMIC 0.1uF 50V
C113	1-131-381-00	s	TANTALUM 47uF 10% 10V
C114	1-131-381-00	s	TANTALUM 47uF 10% 10V
C115	1-161-485-00	s	CERAMIC 0.1uF 50V
C116	1-161-485-00	s	CERAMIC 0.1uF 50V
CN1-8	1-764-273-11	s	CONNECTOR, BNC, FEMALE
CN102	1-563-341-11	s	CONNECTOR, DIN 96P, FEMALE
IC101	8-759-925-37	s	IC HA3-5033-5
IC102	8-759-925-37	s	IC HA3-5033-5
L101	1-412-525-31	s	INDUCTOR 10UH
L102	1-412-525-31	s	INDUCTOR 10UH
L103-106	1-410-802-11	s	INDUCTOR 39N
PS101	⚠1-532-686-21	s	LINK, IC 2.7A
PS102	⚠1-532-686-21	s	LINK, IC 2.7A
R101	1-215-445-00	s	METAL 10K 1% 1/6W
R102	1-215-397-00	s	METAL 100 1% 1/6W
R103	1-215-394-00	s	METAL 75 1% 1/6W
R104	1-215-445-00	s	METAL 10K 1% 1/6W
R105	1-215-397-00	s	METAL 100 1% 1/6W
R106	1-215-394-00	s	METAL 75 1% 1/6W

DEC-76 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
2pcs	2-182-909-01	o	LEVER, PC BOARD
2pcs	7-626-320-11	s	PIN, SPRING 3X8
4pcs	7-682-947-01	s	SCREW +PSW 3X6
4pcs	7-685-547-14	s	SCREW +BTP 3X10 TYPE2 N-S
C1	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C2-4	1-126-933-11	s	ELECT 100uF 20% 16V
C5	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C6	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C7	1-126-933-11	s	ELECT 100uF 20% 16V
C8	1-126-933-11	s	ELECT 100uF 20% 16V
C9	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C10	1-124-903-11	s	ELECT 1uF 20% 50V
C11	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C12	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C13	1-163-251-11	s	CERAMIC, CHIP 100PF 5% 50V
C14	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C15	1-126-933-11	s	ELECT 100uF 20% 16V
C16	1-126-933-11	s	ELECT 100uF 20% 16V
C17	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C18	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C19	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C20	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C21	1-163-239-11	s	CERAMIC, CHIP 33PF 5% 50V
C22	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C23	1-163-125-00	s	CERAMIC, CHIP 220PF 5% 50V
C24	1-135-145-11	s	TANTALUM, CHIP 0.47uF 10% 35V
C25	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C26	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C27	1-124-903-11	s	ELECT 1uF 20% 50V
C28	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C29	1-163-251-11	s	CERAMIC, CHIP 100PF 5% 50V
C30	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C31-37	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C38	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C39	1-126-933-11	s	ELECT 100uF 20% 16V
C40	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C41	1-135-072-21	s	TANTALUM, CHIP 0.22uF 10% 35V
C42-44	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C45	1-126-233-11	s	ELECT 22uF 20% 50V
C46	1-163-125-00	s	CERAMIC, CHIP 220PF 5% 50V
C47	1-126-233-11	s	ELECT 22uF 20% 50V
C48	1-126-154-11	s	ELECT 47uF 20% 6.3V
C49	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C50	1-163-251-11	s	CERAMIC, CHIP 100PF 5% 50V
C51	1-126-154-11	s	ELECT 47uF 20% 6.3V
C52	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C53	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C54	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C55	1-126-154-11	s	ELECT 47uF 20% 6.3V
C56	1-126-154-11	s	ELECT 47uF 20% 6.3V
C57-59	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C60	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C61	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C62	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C63	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C64	1-126-154-11	s	ELECT 47uF 20% 6.3V
C65	1-135-076-21	s	TANTALUM, CHIP 1uF 10% 35V
C66	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C67	1-126-933-11	s	ELECT 100uF 20% 16V

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C68-70	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C71	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C72	1-126-154-11	s	ELECT 47uF 20% 6.3V
C73	1-126-157-11	s	ELECT 10uF 20% 16V
C74-76	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C77	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C78-80	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C81	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C82	1-126-154-11	s	ELECT 47uF 20% 6.3V
C83	1-163-125-00	s	CERAMIC, CHIP 220PF 5% 50V
C84	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C85	1-126-154-11	s	ELECT 47uF 20% 6.3V
C86	1-126-154-11	s	ELECT 47uF 20% 6.3V
C87-90	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C92	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C93	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C94	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C95	1-126-933-11	s	ELECT 100uF 20% 16V
C96	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C97	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C98	1-126-933-11	s	ELECT 100uF 20% 16V
C99	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C100-104	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C105	1-126-933-11	s	ELECT 100uF 20% 16V
C106-111	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C112	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C113	1-126-933-11	s	ELECT 100uF 20% 16V
C114	1-163-251-11	s	CERAMIC, CHIP 100PF 5% 50V
C115	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C118	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C119-121	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C122-126	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C127	1-163-251-11	s	CERAMIC, CHIP 100PF 5% 50V
C128	1-163-251-11	s	CERAMIC, CHIP 100PF 5% 50V
C130-132	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C133	1-163-227-11	s	CERAMIC, CHIP 10PF 5% 50V
C134	1-135-149-21	s	TANTALUM, CHIP 2.2uF 10% 10V
C135	1-135-149-21	s	TANTALUM, CHIP 2.2uF 10% 10V
C136	1-163-235-11	s	CERAMIC, CHIP 22PF 5% 50V
C137-147	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C148	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C149	1-126-933-11	s	ELECT 100uF 20% 16V
C150	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C152	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C161	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C162	1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C302-305	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C306-313	1-126-925-11	s	ELECT 470uF 20% 10V
C314-320	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C321	1-126-948-11	s	ELECT 100uF 20% 35V
C322-345	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C401	1-126-947-11	s	ELECT 47uF 20% 35V
C402	1-126-947-11	s	ELECT 47uF 20% 35V
C403	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C404	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C405	1-163-245-11	s	CERAMIC, CHIP 56PF 5% 50V
C406	1-126-157-11	s	ELECT 10uF 20% 16V
C407	1-163-227-11	s	CERAMIC, CHIP 10PF 5% 50V
C408	1-163-125-00	s	CERAMIC, CHIP 220PF 5% 50V

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C409-419	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C420	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C421	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C422	1-163-245-11	s	CERAMIC, CHIP 56PF 5% 50V
C423	1-163-235-11	s	CERAMIC, CHIP 22PF 5% 50V
C424	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C425	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C426	1-163-235-11	s	CERAMIC, CHIP 22PF 5% 50V
C427	1-163-235-11	s	CERAMIC, CHIP 22PF 5% 50V
C428	1-126-157-11	s	ELECT 10uF 20% 16V
C429-436	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C437	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C438-443	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C444	1-126-933-11	s	ELECT 100uF 20% 16V
C445	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C446	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C447	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C448	1-163-145-00	s	CERAMIC, CHIP 0.0015uF 5% 50V
C449-452	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C453	1-163-239-11	s	CERAMIC, CHIP 33PF 5% 50V
C454	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C455	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C456	1-163-275-11	s	CERAMIC, CHIP 0.001uF 5% 50V
C457	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C458	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C459	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C460	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C461	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C462	1-163-037-11	s	CERAMIC, CHIP 0.022uF 10% 25V
C463	1-164-161-11	s	CERAMIC, CHIP 0.0022uF 10% 100V
C464-480	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C481	1-163-121-00	s	CERAMIC, CHIP 150PF 5% 50V
C482	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C600	1-126-933-11	s	ELECT 100uF 20% 16V
C601	1-163-097-00	s	CERAMIC, CHIP 15PF 5% 50V
C602	1-163-097-00	s	CERAMIC, CHIP 15PF 5% 50V
C603	1-126-933-11	s	ELECT 100uF 20% 16V
C604	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C605	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C606	1-126-233-11	s	ELECT 22uF 20% 50V
C607-625	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C627	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
CN101	1-506-746-11	s	CONNECTOR, DIN 48P, MALE
CN102	1-506-748-11	s	CONNECTOR, DIN 96P, MALE
CN103	1-506-469-11	s	CONNECTOR 4P, MALE
CNI306	1-540-119-11	o	SOCKET, IC (IC113) 44P
CNI401	1-540-119-11	o	SOCKET, IC (IC113) 44P
CNI412	1-540-069-11	s	SOCKET, IC (IC113) 84P
CNI602	1-526-950-11	o	SOCKET, IC 64P
D1	8-719-123-82	s	DIODE 1SS303
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-123-82	s	DIODE 1SS303
D4	8-719-800-76	s	DIODE 1SS226
D5	8-719-123-82	s	DIODE 1SS303
D6	8-719-800-76	s	DIODE 1SS226
D8	8-719-800-76	s	DIODE 1SS226
D9	8-719-800-76	s	DIODE 1SS226
D10	8-719-105-28	s	DIODE RD2.4M-B

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D11	8-719-800-76	s	DIODE 1SS226
D301	8-719-400-35	s	LED LN35BP, GRN
D401	8-719-104-34	s	DIODE 1S2835
D402	8-719-912-20	s	DIODE 1SS120
D606	8-719-421-11	s	DIODE LN15BP, GRN/RED
D607	8-719-421-11	s	DIODE LN15BP, GRN/RED
D608	8-719-820-12	s	LED TLR224 RED
D609	8-719-104-34	s	DIODE 1S2835
D900	8-719-109-75	s	DIODE RD4.3ES-B2
D901	8-719-109-75	s	DIODE RD4.3ES-B2
FL1	1-239-318-11	s	FILTER, LOW PASS
IC1	8-759-239-58	s	IC TC74HC221AF
IC2	8-759-014-29	s	IC MC34184M
IC3	8-759-925-90	s	IC SN74HC74ANS
IC4	8-759-239-23	s	IC TC74HC86AF
IC5	8-759-009-06	s	IC MC14052BF
IC6	8-759-182-47	s	IC CLC520AJE-L
IC7	8-759-014-29	s	IC MC34184M
IC8	8-759-014-29	s	IC MC34184M
IC9	8-759-300-71	s	IC HD14053BFP
IC10	8-759-098-17	s	IC LT1191CS8
IC11	8-759-702-08	s	IC NJM360M
IC12	8-752-015-81	s	IC CX20158
IC13	8-759-105-49	s	IC UPC319G2
IC14	8-759-239-55	s	IC TC74HC123AF
IC15	8-752-059-88	s	IC CXA1693Q
IC16	8-759-971-95	s	IC LM317LZ
IC17	8-759-030-16	s	IC MC34182M
IC18	8-759-030-16	s	IC MC34182M
IC19	8-752-058-62	s	IC CXA1496AQ
IC20	8-759-948-01	s	IC 74F04SJ
IC21	8-759-515-63	s	IC IDT74FCT821ATSO
IC22	8-759-702-08	s	IC NJM360M
IC23	8-759-985-55	s	IC 74AC245SJ
IC24	8-759-177-16	s	IC CXD8860Q
IC25	8-759-175-92	s	IC CXD8819AQ
IC26	8-752-334-55	s	IC CXD1175M
IC27	8-759-517-95	s	IC IDT74FCT827ATSO
IC28	8-759-030-16	s	IC MC34182M
IC29	8-759-927-17	s	IC SN74HCT540NS
IC30	8-759-517-95	s	IC IDT74FCT827ATSO
IC31	8-759-232-52	s	IC TC74HC133AF
IC34	8-759-239-55	s	IC TC74HC123AF
IC36	8-759-981-48	s	IC NJM082M
IC39	8-752-340-57	s	IC CXK1203Q
IC40	8-759-239-58	s	IC TC74HC221AF
IC41	8-759-925-90	s	IC SN74HC74ANS
IC42	8-759-925-76	s	IC SN74HC08ANS
IC43	8-759-926-98	s	IC SN74HC4040ANS
IC45	8-759-095-59	s	IC M5237ML-TP1
IC302	8-759-073-52	s	IC 74AC04SJ
IC303	8-759-918-40	s	IC CX20194
IC304	8-759-003-17	s	IC LM317T
IC305	8-759-985-84	s	IC 74AC574SJ
IC306	8-759-268-07	o	IC EPM7032-DEC76A, PLD
IC307	8-759-926-77	s	IC SN74HC541ANS
IC308	8-752-359-55	s	IC CXK48324R
IC309	8-752-359-55	s	IC CXK48324R

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
IC310	8-752-359-55	s	IC CXK48324R
IC311	8-752-359-55	s	IC CXK48324R
IC312	8-752-359-55	s	IC CXK48324R
IC313	8-752-359-55	s	IC CXK48324R
IC314	8-752-359-55	s	IC CXK48324R
IC315	8-752-359-55	s	IC CXK48324R
IC316	8-752-359-55	s	IC CXK48324R
IC400	8-759-095-59	s	IC M5237ML-TP1
IC401	8-759-268-08	o	IC EPM7032-DEC76B, PLD
IC402	8-752-015-81	s	IC CX20158
IC403	8-759-515-63	s	IC IDT74FCT821ATSO
IC404	8-759-515-63	s	IC IDT74FCT821ATSO
IC405	8-759-702-08	s	IC NJM360M
IC406	8-759-908-92	s	IC TL084CNS
IC407	8-759-300-71	s	IC HD14053BFP
IC408	8-759-987-27	s	IC LM1881M
IC409	8-759-239-58	s	IC TC74HC221AF
IC411	8-759-239-58	s	IC TC74HC221AF
IC412	8-759-268-09	o	IC EPM7128-DEC76C, PLD
IC413	8-759-510-22	s	IC CXD8046G
IC414	8-759-989-04	s	IC 74F74SJ
IC415	8-759-515-63	s	IC IDT74FCT821ATSO
IC417	8-759-991-85	s	IC 74F00SJ
IC418	8-759-986-27	s	IC 74ACT163SJ
IC419	8-741-601-11	s	IC SBX1601A
IC420	8-759-986-27	s	IC 74ACT163SJ
IC421	8-759-014-29	s	IC MC34184M
IC422	8-759-907-81	s	IC SN74LS221NS
IC423	8-752-306-51	s	IC CX23065A
IC424	8-759-989-04	s	IC 74F74SJ
IC425	8-759-300-71	s	IC HD14053BFP
IC426	8-759-985-55	s	IC 74AC245SJ
IC427	8-759-985-55	s	IC 74AC245SJ
IC428	8-759-234-20	s	IC TC7S08F
IC600	8-759-064-36	s	IC MB88346BPFV-EF
IC601	8-759-973-71	s	IC TL7705CPS-B
IC602	8-759-268-10	o	IC 6475208-DEC76D, PROM
IC603	8-759-927-12	s	IC SN74HCT244ANS
IC605	8-759-927-46	s	IC SN74HC00ANS
IC606	8-759-926-05	s	IC SN74HC125ANS
IC607	8-759-926-05	s	IC SN74HC125ANS
IC608	8-759-938-68	s	IC CXD1095Q
IC609	8-759-930-21	s	IC SN74LS85NS
IC626	8-759-927-46	s	IC SN74HC00ANS
L1	1-408-982-11	s	INDUCTOR 100uH
L2	1-408-982-11	s	INDUCTOR 100uH
L4-11	1-408-982-11	s	INDUCTOR 100uH
L13-17	1-408-982-11	s	INDUCTOR 100uH
L301-304	1-412-525-31	s	INDUCTOR 10UH
L401	1-408-978-21	s	INDUCTOR 47uH
L402	1-408-978-21	s	INDUCTOR 47uH
L403	1-408-984-21	s	INDUCTOR 150UH
L404	1-412-525-31	s	INDUCTOR 10UH
L405	1-410-799-41	s	INDUCTOR 0.022uH
L406	1-410-799-41	s	INDUCTOR 0.022uH
L407	1-408-978-21	s	INDUCTOR 47uH
L408	1-414-137-31	s	INDUCTOR 0.22UH
L601	1-408-974-21	s	INDUCTOR 22UH

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
PS301	⚠1-532-686-21	s	LINK, IC 2.7A
PS302	⚠1-532-686-21	s	LINK, IC 2.7A
PS303	⚠1-532-686-21	s	LINK, IC 2.7A
PS304	⚠1-532-686-21	s	LINK, IC 2.7A
Q1	8-729-118-56	s	TRANSISTOR 2SK852-X2
Q2	8-729-118-56	s	TRANSISTOR 2SK852-X2
Q3	8-729-117-32	s	TRANSISTOR 2SC4177
Q4	8-729-117-32	s	TRANSISTOR 2SC4177
Q5	8-729-216-22	s	TRANSISTOR 2SA1162
Q6	8-729-601-58	s	TRANSISTOR 2SC3053-C
Q7	8-729-601-58	s	TRANSISTOR 2SC3053-C
Q8	8-729-216-22	s	TRANSISTOR 2SA1162
Q9	8-729-118-56	s	TRANSISTOR 2SK852-X2
Q10	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q11	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
Q12	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q13	8-729-900-53	s	TRANSISTOR DTC114EK
Q14	8-729-119-77	s	TRANSISTOR 2SA1175-FEK
Q15	8-729-907-00	s	TRANSISTOR DTC114EU
Q16	8-729-907-00	s	TRANSISTOR DTC114EU
Q401	8-729-216-22	s	TRANSISTOR 2SA1162
Q402	8-729-216-22	s	TRANSISTOR 2SA1162
Q601	8-729-216-22	s	TRANSISTOR 2SA1162
Q602	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q603	8-729-216-22	s	TRANSISTOR 2SA1162
Q604	8-729-120-28	s	TRANSISTOR 2SC1623-L5L6
Q1000	8-729-105-68	s	TRANSISTOR 2SC3356-K
Q1001	8-729-105-68	s	TRANSISTOR 2SC3356-K
Q1002	8-729-105-68	s	TRANSISTOR 2SC3356-K
Q1003	8-729-105-68	s	TRANSISTOR 2SC3356-K
R1	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R2	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R3	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R4	1-218-776-11	s	METAL 1M 0.5% 1/10W
R5	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R6	1-216-295-00	s	METAL, CHIP 0
R8	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R9	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R10	1-216-637-11	s	METAL, CHIP 270 0.5% 1/10W
R11	1-216-658-11	s	METAL, CHIP 2K 0.5% 1/10W
R12	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R13	1-216-637-11	s	METAL, CHIP 270 0.5% 1/10W
R14	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R16	1-216-603-11	s	METAL, CHIP 10 0.5% 1/10W
R17	1-218-768-11	s	METAL 470K 0.5% 1/10W
R18	1-216-620-11	s	METAL, CHIP 51 0.5% 1/10W
R19	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R20	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R21	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R22	1-216-657-11	s	METAL, CHIP 1.8K 0.5% 1/10W
R23	1-216-649-11	s	METAL, CHIP 820 0.5% 1/10W
R24	1-216-603-11	s	METAL, CHIP 10 0.5% 1/10W
R25	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R26	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R27	1-216-657-11	s	METAL, CHIP 1.8K 0.5% 1/10W
R28	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R29	1-216-658-11	s	METAL, CHIP 2K 0.5% 1/10W
R30	1-218-776-11	s	METAL 1M 0.5% 1/10W

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R31	1-216-633-11	s	METAL, CHIP 180 0.5% 1/10W
R32	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R33	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R34	1-216-662-11	s	METAL, CHIP 3K 0.5% 1/10W
R35	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R36	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R37	1-216-665-11	s	METAL, CHIP 3.9K 0.5% 1/10W
R38	1-216-620-11	s	METAL, CHIP 51 0.5% 1/10W
R39	1-216-639-11	s	METAL, CHIP 330 0.5% 1/10W
R40	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R41	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R42	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R43	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R44	1-216-647-11	s	METAL, CHIP 680 0.5% 1/10W
R45	1-218-776-11	s	METAL 1M 0.5% 1/10W
R46	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R47	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R48	1-216-620-11	s	METAL, CHIP 51 0.5% 1/10W
R49	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R50	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R51	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R53	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R54	1-216-295-00	s	METAL, CHIP 0
R55	1-216-686-11	s	METAL, CHIP 30K 0.5% 1/10W
R57	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R58	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R59	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R60	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R61	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R62	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R63	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R64	1-216-665-11	s	METAL, CHIP 3.9K 0.5% 1/10W
R65	1-216-669-11	s	METAL, CHIP 5.6K 0.5% 1/10W
R67	1-216-639-11	s	METAL, CHIP 330 0.5% 1/10W
R68	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R69	1-216-646-11	s	METAL, CHIP 620 0.5% 1/10W
R70	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R71	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R72	1-218-776-11	s	METAL 1M 0.5% 1/10W
R73	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R74	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R75	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R76	1-216-668-11	s	METAL, CHIP 5.1K 0.5% 1/10W
R77	1-216-666-11	s	METAL, CHIP 4.3K 0.5% 1/10W
R78	1-216-646-11	s	METAL, CHIP 620 0.5% 1/10W
R79	1-216-657-11	s	METAL, CHIP 1.8K 0.5% 1/10W
R80	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R81	1-216-676-11	s	METAL, CHIP 11K 0.5% 1/10W
R82	1-216-666-11	s	METAL, CHIP 4.3K 0.5% 1/10W
R83	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R84	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R85	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R86	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R87	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R88	1-216-636-11	s	METAL, CHIP 240 0.5% 1/10W
R89	1-216-633-11	s	METAL, CHIP 180 0.5% 1/10W
R90	1-216-655-11	s	METAL, CHIP 1.5K 0.5% 1/10W
R91	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R92	1-216-295-00	s	METAL, CHIP 0

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R93	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R94	1-216-673-11	s	METAL, CHIP 8.2K 0.5% 1/10W
R95	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R96	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R97	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R98	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W
R99	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R100	1-216-672-11	s	METAL, CHIP 7.5K 0.5% 1/10W
R101	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R102	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R103	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R104	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R105	1-216-655-11	s	METAL, CHIP 1.5K 0.5% 1/10W
R106	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R107	1-216-661-11	s	METAL, CHIP 2.7K 0.5% 1/10W
R108	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R109	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R110	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R111	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R112	1-216-295-00	s	METAL, CHIP 0
R113	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R114-123	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R124	1-216-295-00	s	METAL, CHIP 0
R125-134	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R135-138	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R139	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R140	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R141	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R142	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R143	1-216-661-11	s	METAL, CHIP 2.7K 0.5% 1/10W
R144-146	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R147	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R148	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R149	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R150	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R151	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R152	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R153	1-216-670-11	s	METAL, CHIP 6.2K 0.5% 1/10W
R154	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W
R155	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W
R156	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R157	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R158	1-216-667-11	s	METAL, CHIP 4.7K 0.5% 1/10W
R159	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W
R160	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W
R161	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R162	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R163	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R164	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R165	1-216-660-11	s	METAL, CHIP 2.4K 0.5% 1/10W
R166	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R167	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R168	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R169	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R170	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R172	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R173	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R174	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R175	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R176	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R177	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R178	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R180	1-216-295-00	s	METAL, CHIP 0
R181	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R182	1-216-671-11	s	METAL, CHIP 6.8K 0.5% 1/10W
R183	1-216-687-11	s	METAL, CHIP 33K 0.5% 1/10W
R184	1-216-679-11	s	METAL, CHIP 15K 0.5% 1/10W
R185	1-218-760-11	s	METAL, CHIP 220K 0.5% 1/10W
R186	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R187	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R189	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R190	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R191	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R192	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R193	1-216-634-11	s	METAL, CHIP 200 0.5% 1/10W
R194	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R195	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R196	1-216-674-11	s	METAL, CHIP 9.1K 0.5% 1/10W
R197	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R198	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R199-206	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R303	1-216-641-11	s	METAL, CHIP 390 0.5% 1/10W
R305	1-216-636-11	s	METAL, CHIP 240 0.5% 1/10W
R306-310	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R311-313	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R314	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R400	1-216-677-11	s	METAL, CHIP 12K 0.5% 1/10W
R401	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R402	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R403	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R404	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R405	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R406-425	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R426	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R427	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R428	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R429	1-218-772-11	s	METAL 680K 0.5% 1/10W
R430	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R431-443	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R444	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R445	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R446	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R447	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R448	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R449	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R450	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R451	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R452	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R453-462	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R463	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R464	1-216-603-11	s	METAL, CHIP 10 0.5% 1/10W
R465	1-216-699-11	s	METAL, CHIP 100K 0.5% 1/10W
R466	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R467	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R468	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R469	1-216-633-11	s	METAL, CHIP 180 0.5% 1/10W
R470	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R471	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R472	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R473	1-216-647-11	s	METAL, CHIP 680 0.5% 1/10W
R474	1-216-639-11	s	METAL, CHIP 330 0.5% 1/10W
R475	1-216-633-11	s	METAL, CHIP 180 0.5% 1/10W
R476	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R477	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R478	1-216-615-11	s	METAL, CHIP 33 0.5% 1/10W
R479	1-216-615-11	s	METAL, CHIP 33 0.5% 1/10W
R480	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R481	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R482	1-216-623-11	s	METAL, CHIP 68 0.5% 1/10W
R483	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R484	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R485	1-216-633-11	s	METAL, CHIP 180 0.5% 1/10W
R486	1-216-631-11	s	METAL, CHIP 150 0.5% 1/10W
R487	1-216-615-11	s	METAL, CHIP 33 0.5% 1/10W
R488	1-216-615-11	s	METAL, CHIP 33 0.5% 1/10W
R489	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R490	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R491	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R492	1-216-623-11	s	METAL, CHIP 68 0.5% 1/10W
R493	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R494	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R495	1-216-691-11	s	METAL, CHIP 47K 0.5% 1/10W
R496	1-216-623-11	s	METAL, CHIP 68 0.5% 1/10W
R497	1-216-623-11	s	METAL, CHIP 68 0.5% 1/10W
R498	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R499	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R500	1-216-659-11	s	METAL, CHIP 2.2K 0.5% 1/10W
R501	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R502	1-216-643-11	s	METAL, CHIP 470 0.5% 1/10W
R503	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R504	1-216-686-11	s	METAL, CHIP 30K 0.5% 1/10W
R505	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R506	1-216-624-11	s	METAL, CHIP 75 0.5% 1/10W
R507-513	1-216-611-11	s	METAL, CHIP 22 0.5% 1/10W
R514	1-216-619-11	s	METAL, CHIP 47 0.5% 1/10W
R515-521	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R522-524	1-216-663-11	s	METAL, CHIP 3.3K 0.5% 1/10W
R525	1-216-639-11	s	METAL, CHIP 330 0.5% 1/10W
R526	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R529	1-216-676-11	s	METAL, CHIP 11K 0.5% 1/10W
R530	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R600	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R601	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R602	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R603	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R604	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R605	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R606	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R610-613	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R614	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R615	1-216-635-11	s	METAL, CHIP 220 0.5% 1/10W
R616-621	1-216-683-11	s	METAL, CHIP 22K 0.5% 1/10W
R622-626	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R631	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R632	1-216-651-11	s	METAL, CHIP 1K 0.5% 1/10W
R633-638	1-216-627-11	s	METAL, CHIP 100 0.5% 1/10W
R640	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W

(DEC-76 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R641	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
R644	1-216-675-11	s	METAL, CHIP 10K 0.5% 1/10W
RB600	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB601	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB602	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB603	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB604	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB605	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB606	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB607	1-235-337-11	s	RESISTOR BLOCK 22Kx8
RB608	1-231-541-00	s	RESISTOR BLOCK 22Kx4
RV1	1-230-740-11	s	RES, VAR, CARBON 5K
RV2	1-237-029-11	s	RES, ADJ METAL 50
RV3	1-237-030-11	s	RES, ADJ METAL 100
RV4	1-237-036-11	s	RES, ADJ METAL 10K
RV7	1-237-034-11	s	RES, ADJ METAL 2K
RV8	1-237-036-11	s	RES, ADJ METAL 10K
RV401	1-230-750-11	s	RES, ADJ, CERMET 10K
RV402	1-230-740-11	s	RES, VAR, CARBON 5K
RV404	1-237-033-11	s	RES, ADJ METAL 1K
RV602	1-230-740-11	s	RES, VAR, CARBON 5K
S1	1-554-398-00	s	SWITCH, TOGGLE
S2	1-554-399-00	s	SWITCH, TOGGLE
S3	1-570-602-11	s	SWITCH, DIP 2-CKT
S5	1-554-399-00	s	SWITCH, TOGGLE
S6	1-554-399-00	s	SWITCH, TOGGLE
S401	1-570-620-11	s	SWITCH, DIP 5-CKT
S403	1-554-027-00	s	SWITCH, DIGITAL
S404	1-554-027-00	s	SWITCH, DIGITAL
S405	1-552-509-00	s	SWITCH, DIP 1-CKT
S601	1-570-623-11	s	SWITCH, DIP 8-CKT
S602	1-570-623-11	s	SWITCH, DIP 8-CKT
S603	1-554-303-21	s	SWITCH, TACTILE
X1	1-577-537-11	s	VCO, CRYSTAL 35.468950MHz
X401	1-577-597-11	s	VCO, CRYSTAL 27.00000MHz
X601	1-567-928-11	s	VIBLATOR, CERAMIC 20.00MHz

このマニュアルに記載されている事柄の著作権は当社にあり，説明内容は機器購入者の使用を目的としています。
従って，当社の許可なしに無断で複写したり，説明内容（操作，保守等）と異なる目的で本マニュアルを使用することを禁止します。

The material contained in this manual consists of information that is the property of Sony Corporation and is intended solely for use by the purchasers of the equipment described in this manual.
Sony Corporation expressly prohibits the duplication of any portion of this manual or the use thereof for any purpose other than the operation or maintenance of the equipment described in this manual without the express written permission of Sony Corporation.

Le matériel contenu dans ce manuel consiste en informations qui sont la propriété de Sony Corporation et sont destinées exclusivement à l'usage des acquéreurs de l'équipement décrit dans ce manuel.
Sony Corporation interdit formellement la copie de quelque partie que ce soit de ce manuel ou son emploi pour tout autre but que des opérations ou entretiens de l'équipement à moins d'une permission écrite de Sony Corporation.

Das in dieser Anleitung enthaltene Material besteht aus Informationen, die Eigentum der Sony Corporation sind, und ausschließlich zum Gebrauch durch den Käufer der in dieser Anleitung beschriebenen Ausrüstung bestimmt sind.
Die Sony Corporation untersagt ausdrücklich die Vervielfältigung jeglicher Teile dieser Anleitung oder den Gebrauch derselben für irgendeinen anderen Zweck als die Bedienung oder Wartung der in dieser Anleitung beschriebenen Ausrüstung ohne ausdrückliche schriftliche Erlaubnis der Sony Corporation.